NEW
EXPERIMENTS
VPON THE
VIPER
BY
M. CHARRAS.
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: a straight
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Recipient

NEW EXPERIMENTS UPON VIPERS.

Containing also an Exact

DESCRIPTION

Of all the

Parts of a VIPER,

The *SEAT* of its

POYSON,

AND THE

Several EFFECTS thereof,

Together with the

EXQUISITE REMEDIES,

That by the Skilful may be drawn from *Vipers*; as well for the *Cure* of their *Bitings*, as for that of other Maladies.

Originally written in French

By *M. CHARAS* of *Paris*.

Now rendred English.

Multa Patres olim: Nos plurima, plura Futuri
Invenient; Cupidis nec porta negata Novorum.

LONDON, Printed by *T. N.* for *J. Martyn*, Printer to the R. Society, at the Bell in S. *Pauls* Church-yard, and a little without *Temple-Bar*. 1670.

THE Preface.

MAny will perhaps wonder, that after ſo many famous Authours, Antient and Modern, who have written of VIPERS, I ſhould yet undertake to labour in an Argument, which in all likelihood they ſhould have exhauſted. But if reflexion be made on the many wonders, that are found in the Body of this Animal, it will be eaſily granted, that it cannot be inquir'd into with too much exactneſs, and that it is not a work, that can be finiſh't at one or two ſittings.

What Obſervations have been left us by knowing men, although they be not carried to their perfection, may be very uſeful to thoſe, that are come after them, to make them diſcover what had eſcaped their diligence. And without this aid, I ſhould not have had the

confidence of undertaking this Work; in which I have propo'd to my ſelf three main things, that may much contribute to the illuſtration of the Hiſtory concerning Vipers. *The* firſt *is, to examine ſundry Obſervations of the Antients, which have hitherto paſs'd for true, though moſt of them are not ſo. The* ſecond, *to give an accompt of other Obſervations, which have been unknown to our Predeceſſors. The* third, *to find in the* Viper, *which cauſeth ſo many miſchiefs, Specifick Remedies againſt its Biting, which had not been diſcover'd before, and may ſerve to overcome many troubleſom Diſtempers, which the ordinary Remedies were not able to conquer.*

The Enterpriſe, certainly, is bold; and, I confeſs, I ſhould never have compaſs'd it, what hope ſoever I might have conceived of it, had I not been aſſiſted by ſome knowing Phyſitians, whoſe light hath been very helpful to me.

Their Modeſty permits not, I ſhould here name them; it ſufficeth the Publick to know, that a good part of the rare things in this Treatiſe is due to them. They had the kindneſs to meet often at my Houſe for the ſpace of three months, and there to ſee

made

made exact Diſſections of Vipers, *which by my care were brought to me from all Parts of this Kingdom; and to ſee alſo Experiments tryed of their biting, upon divers Animals, and to examine their Bodies, immediately open'd after their death, to diſcover the true cauſe of it; and to preſcribe Remedies, anſwerable to their Conjectures, and to take notice of the ſucceſs of the ſame.*

In diſſecting all theſe Vipers, *we were willing to ſee the parts, which Authors have taken notice of, and which have alſo been repreſented in the Books of ſome of them: And comparing them with the Natural ones, that were before our Eyes, we found great omiſſions of very conſiderable parts; an introduction of ſome imaginary ones, and repreſentations and ſcituations of ſeveral that were ill deſigned, and ill enough placed. It was thought fit, I ſhould endeavour to perform ſomething more accompliſh't: And Monſieur* Boſſe, *whoſe skill and dexterity in the Art of Deſigning and Graving is known and eſteem'd of all the World, in things of a far ſub'limer nature than the Anatomy of* Vipers, *being happily preſent at one of our meetings, and taking great pleaſure to oblige*

his Friends, expreſſed from that very time, that he was very willing to ſecond my intentions: And having received from me a ſufficient number of Subjects, hath taken the pains to deſign them after the life, and thereupon to grave all the conſiderable parts of this Animal. In a word, I have omitted nothing of what might render my Deſign anſwerable to the wiſhes of all Learned and Curious men.

Now as thoſe, who, ſpeaking of a matter that hath been often handled by others, cannot but muſt often repeat again, what hath been already ſaid of it; I thought, I was not to ſcruple to enlarge my ſelf a little, that I might not give an imperfect Anatomy of the Viper, of which it was fit enough to deſcribe as well the great number of the true parts, that have been known to our Anceſtors, as the new ones, by me found after them.

I ſay nothing of my way of Writing. From a perſon of my profeſſion, you are not to expect the Elegancy and Purity of our Tongue. I thought it enough for me, to deliver my ſelf clearly and intelligibly, which is, in my opinion, all that could be expected from me.

For

For the reſt, I think, I am the firſt, that hath given to France *a* Treatiſe *of the* Viper *in its Native Language. Thoſe who underſtand no other Languages, may think themſelves obliged by it, in regard they would elſe have been ignorant of abundance of things, that deſerve to be known.* Farewell.

THE

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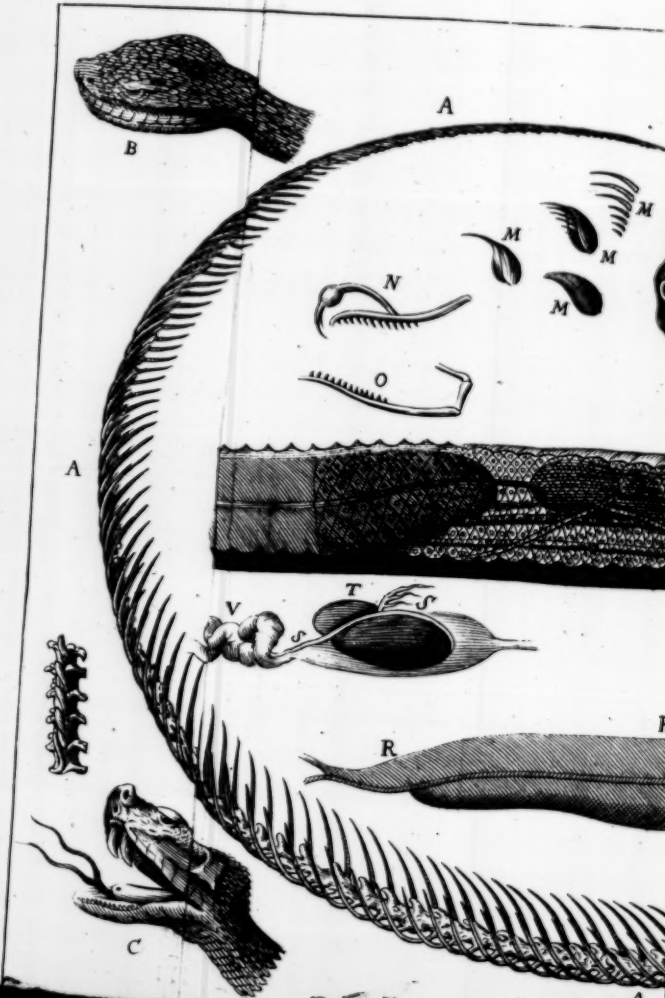
FINIS.

ERRATA.

PAge 13. line 6. read *seen on.* p. 29. l. 8. r. *and that.* p. 95. l. 27. r. *and the want of goodneſs.* p. 120. l. 5. r. *the bitten animal would be.* p. 126. l. 12. r. *twice through,* for, *twice in the day-light.* p. 163. l. 12. r. *adapt.* p. 165. l. 1. r. *with Salt and Dill.* p. 172. l. 1. r. *Simples be in.*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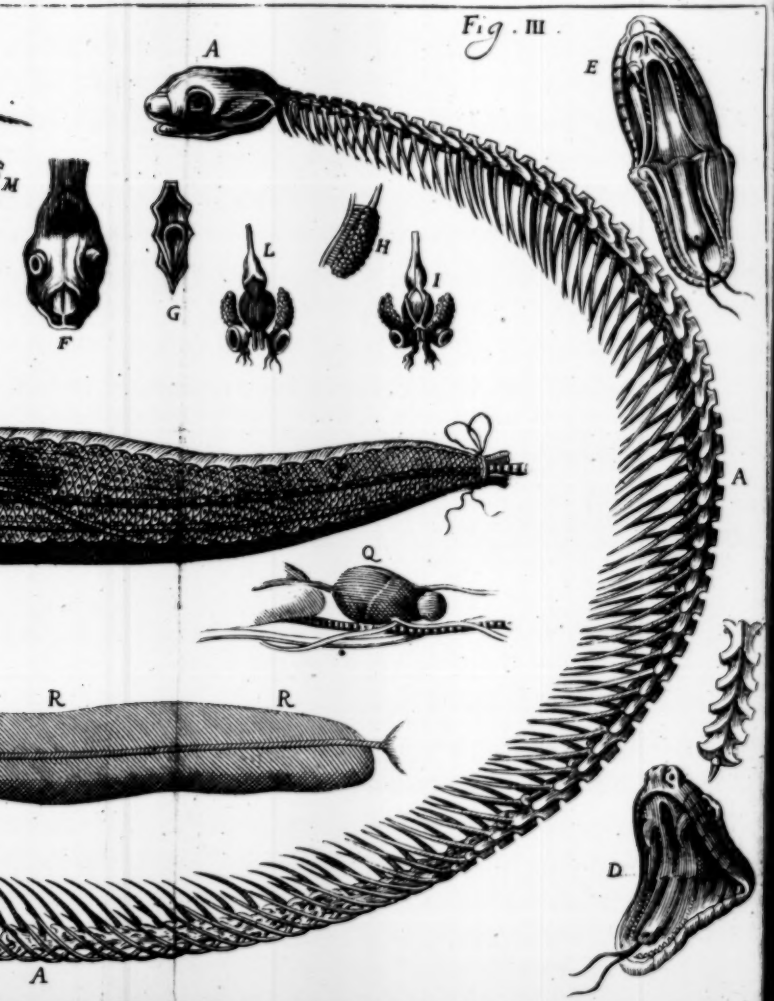
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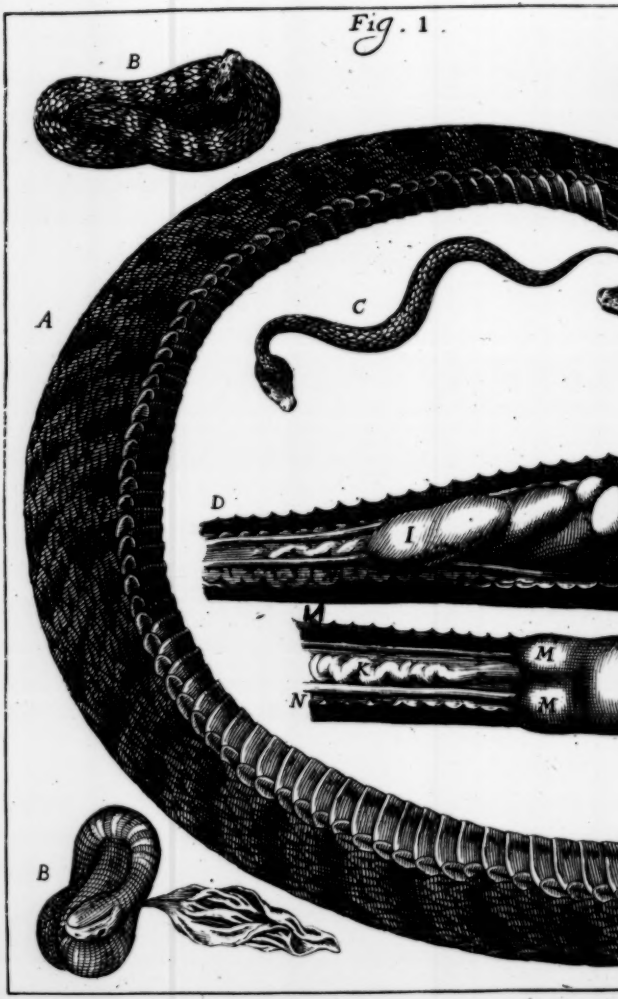
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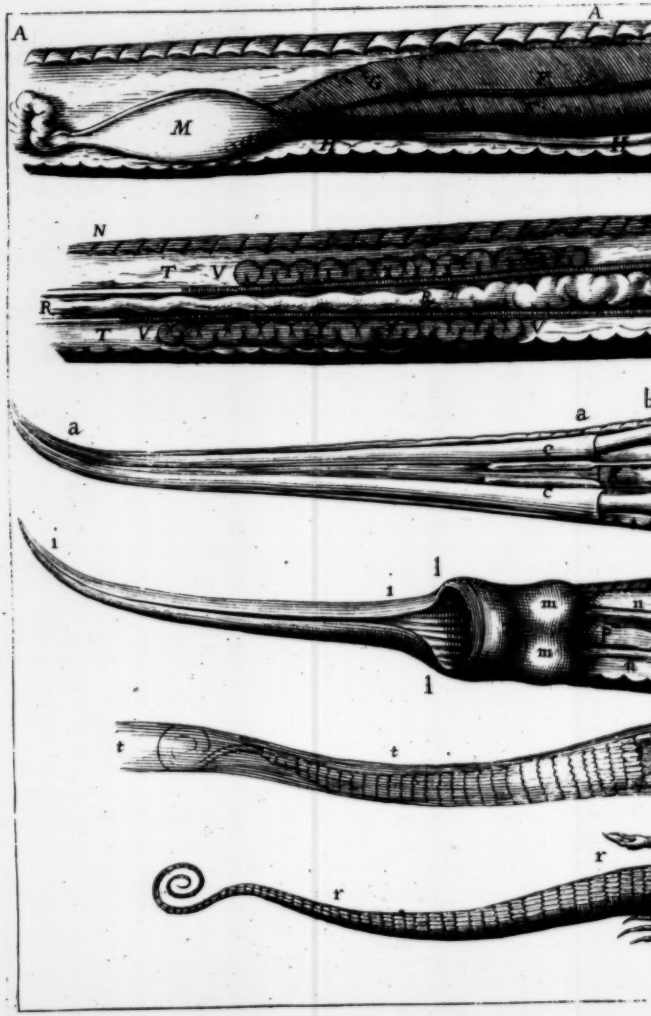
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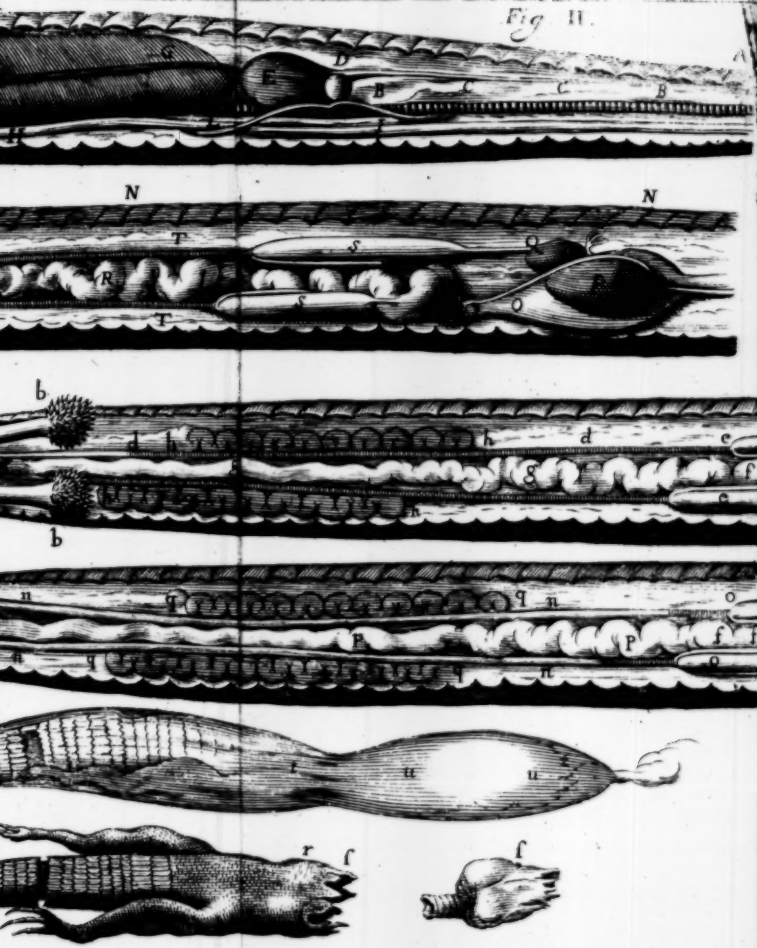
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THE ANATOMY OF A VIPER.

General Observations upon this Animal.

CHAPTER I.

I Know not, what ground the Antient Writers upon this Animal had, to ſay, that in the Copulation, the Male did inſert his Head into the throat of the Female, and there emitted his ſeed, thence falling into her *Matrix*, where ſhe firſt did form Eggs and then Young Vipers: That the Female, finding a titillation from the emiſſion of the ſeed, ſnapp'd off with her teeth the

head of the Male, and ſo kill'd him; and that the Young Vipers, being ready to be brought forth, did pierce the Womb and the ſides of their Damm, to make a paſſage for themſelves; ſo that by killing her, they revenged in ſome manner the death of their Sire.

I confeſs, that this Story, or Tale rather, having neither reaſon nor experience on its ſide, I cannot take the part of thoſe Authors. I eſteem, that a Viper, which is a kind of creeping Serpent, is indeed procreated by the conjunction of Male and Female; but this is done by means of the Organs deſigned for Generation; of which we ſhall make a deſcription in their proper place, and which this Animal hath common with all others, and that more in number, than moſt Animals.

The Viper differs from other Serpents, not only in this, that it creeps more ſlowly, and jumps not; but chiefly herein, that its little ones receive their perfection in the womb, and come forth alive after the uſual manner; whereas the Femals of other Serpents lay Eggs, which they incubate, and hatch, either in the Sun, or in their receſſes.

The

The Viper is by many taken for an Image of malice and cruelty; but in reality ſhe is guilty of no ſuch thing, if ſhe be not hurt or vex'd; for, if ſhe be, ſhe becoms furious, aud bites very piercingly: but ſhe never aſſaults Man or beaſt, except ſhe be angred. And if at times it happen, that ſhe bites ſome perſon or other ſleeping in the field, certainly that Body muſt have thruſt or otherwiſe hit her; for elſe ſhe would never have bit him.

It may very well be ſaid, that by that means the Stratagem of *Annibal* ſucceeded, when he cauſed a quantity of earthen Pitchers fill'd with Vipers to be thrown into the Shipps of the King of *Pergamus*, his Enemy; in regard that on the one hand the Pots being broken, did hurt and anger the Vipers, and ſtirr'd them up to bite whatſoever was within the reach of their teeth; and on the other, the ſight of theſe creeping Creatures, ſcattered about here and there in the Ships, frighted the Souldiers and diſorder'd them, ſo that they could not fight.

Mean time a Viper attacks and kills thoſe Animals, which ſhe means to devour for her nouriſhment, as Spaniſh Flyes, Scorpions, Froggs, Mice, Moles, Lizzards and the

like; which she swallows whole, after she hath kill'd them with her bigger Teeth. The smaller prey she sends down whole into her stomach; the bigger she partly lodgeth in her stomach, partly in her weasand.

There can hardly be made any perfect digestion in the Stomach of Vipers, both because the heat is there not well united, by reason of the great aperture, there is at the mouth, where the Oesophagus or Weasand ends; and because they have not moisture enough to help the fermentation and the Concoction of food. But yet this hinders not * the conveyance of the Juyce and of the finest part of the swallow'd animals into all the parts of their body for nourishment: Which is not performed but in the space of many days, during which, the excrements and superfluities of the nutriment are carried into the Gutts, whence the grosser parts of them are cast out again by the mouth. This we have lately observ'd in a great part of the body of a Lizzard, which a Viper vomited up twelve days after she was taken; where we saw, that, of the head and of the fore-leggs, and of that part of the body contiguous to them, and which could

could conveniently be placed in the ſtomach of the Viper, there reſted little more than the Bones; but that a great part of the trunk, together with the hind-leggs, and the whole taile, were in a manner in a condition, as if the Viper had ſwallow'd them that day, as appears in the 2d Figure. But we were ſurpriſed, among other things, to ſee, that the parts, which could not enter into the ſtomach, and had remained in the *Oeſophagus*, had kept ſo long well, I mean, without ſuffring any alteration in the skin; although thoſe underneath had contracted ſome lividneſs, which perhaps was an effect of the venemouſneſs of the biting.

Vipers can live for many months without any food, and after they are once taken, they eat no more, living then only upon the Air, they take in. And although they be greedy enough of Lizzards, when at liberty, yet I have found, that having thrown Lizzards alive into a barrel, wherein I kept a good number of living Vipers, and leaving them there whole days and nights, the Vipers did no hurt at all to the Lizzards.

The Subſtance of Vipers is viſcous and compact, and periſheth not but very ſlow-

ly and difficultly. Their Skin is scaly, which defends them from the injuries of the Air, and maketh that the Spirits unite themselves so firmly to the body, that 'tis hard for them to quit it; and we see, that they remain yet many hours in the Head and in all the parts of the trunk, after tis flead, emptied of all the gutts, and cut in many pieces: And this is the cause, that the motions and windings so long continue in them; that the Head is able to bite, and its biting as dangerous, as when the Viper was entire; and that the Heart, even after it is pull'd out of the body, and sever'd from the other inward parts, keeps its beating for many hours. Whence it may be concluded, that the Viper, which is composed of parts so closely united together, and in which are found such perfect Spirits, can impart to Man what it hath most accomplisht and in so great abundance: So that we need not wonder, if we find the remedies, we draw from its body, are of a not-ordinary vertue.

A Viper voids not much excrement, and what she voyds is not offensive, whereas that of *Snakes* stinks much, and hath the smell of stale and corrupt Urine. Neither

ther have we ever found any ill ſmell in opening the veſſels, wherein we uſed to keep Vipers alive, unleſs ſome viper or other had been dead and putrifyed. For my part, I have never received any inconvenience from any ill air, which ſome pretend to iſſue forth at the opening of thoſe Veſſels.

Vipers make no holes in the Earth to hide themſelves in, as other Serpents do; but ordinarily they hide themſelves under ſtones or old ruines, where they may be often found heaped up and wound together in cluſters. When 'tis fair weather, they love to lurk under buſhes and tufted plants.

They commonly couple twice a year, the firſt time in the month of *March*; and they goe with their young ones 4. or 5. months; which being perfect, come forth one after another by the common opening of the *Matrix*, and in great number, even to twenty and twenty five. They draw out with them, in coming forth, a ſmall tegument faſtned to their navil, like an after-birth, which the damm by little and little ſeparateth with her tongue, as they are born one after another.

Vipers caſt a skin every Spring, and ſometimes even in Autumne: which hath

occasioned a belief, that they have a vertue, able to make young again, and to preserve the strength of those, who use them either for a preservative or a remedy.

THE DESCRIPTION OF A VIPER

CHAP. II.

Of the Parts, which present themselves first.

SECT. I.

Of its external Figure.

THe Vipers, Males and Females, that we have in *France*, being of their full growth, are in the middle of their body

dy a good inch thick; but that of Females is bigger, when they are with young, especially when the young ones are ready to come forth. They are commonly two good foot long; and there are some, that are somewhat longer. Their head, which is flat, hath a kind of border round about the edges of its upper part, and in that they differ from *Snakes*, which have all that round bared and taken down, and the Head sharper and narrower, in proportion to their Body.

The Head of a Viper is in all an inch long, and towards the top thereof it is 7 or 8 lines broad; and then lessening by little and little, it is not above 4 or 5 lines broad about the Eyes, and 2 lines onely about the end of the Nose. It is about 2 lines thick.

The Neck, taken where it begins, is about the bigness of a mans little finger. That of Males is ordinarily a little thicker than that of Females: Yet there are some of the Females, which, when full, appear to have a Neck even thicker than that of Males.

The Tail of Males is always longer and thicker than that of Females, because it contains

tains the parts of generation double; and in their Interſtices there are alſo two ſmall bladders ſomewhat long, ſerving for a reſervatory of their ſeed, which make their Tail bigger. This of the Males is about four fingers ſquare long; but that of Females not much longer than three. The upper part of the Taile of Males is, at its beginning, about the bigneſs of their Neck, and ends ſharp, as doth alſo the Tail of Females. Neither of them ſtings, nor have they any venom in them.

SECT. II.

Of the Skin of Vipers.

NO Vipers are ſeen, but they have their skin ſpotted: but the ground of the colour is different enough; for ſometimes 'tis whitiſh, ſometimes reddiſh, in ſome 'tis gray, in others yellow, in others tawny. This ground is always ſpeckled with black ſpots, or at leaſt much darker ones than the reſt; they appear like different cyphers or characters, ranged in ſpaces, even enough, and anſwering one another, eſpecially on the top and the ſides of the Body. Some of them are alſo upon

on the Head, and among the reſt, two in the form of Horns, which take their riſe between both Eyes, and open themſelves and reach towards the two ſides of the top of the Head, and are ſometimes 4. or 5. lines long, each of them, and halfe a line broad. Oppoſite to the middle of theſe two horns, there appears a ſpeck of the bigneſs of a ſmall Lentile, being ſhaped like the Iron of a Pike: And this is that, which is, as 'twere, the firſt and principal of all theſe ſpecks, ſeeming to guide them all along the Back-bone.

The Skin is all cover'd with Scales, the greateſt, ſtrongeſt and moſt conſiderable of which, are thoſe under the whole Body, and ſome under part of the Head. Their bigneſs and force is neceſſary for them, to fortify the Viper in the place that is feebleſt and leaſt capable of defence; beſides that they ſupport the Animal, and ſerve it, inſtead of feet, for creeping, and for carrying its Body to and fro. Theſe great Scales are alwayes of the colour of Steel, from one end to the other, and different from thoſe of Snakes, which are commonly mark'd with a yellow colour. They open, and ſtick, according as the Vi-

Viper will recoyle, or ſtop. The extremity of theſe great Scales is, as 'twere, ſow'd beneath the other litle Scales, which cover the whole Body. Thoſe under the Head, reach in their breadth towards the two Jawes; they are leſſer, ſtreighter and ſofter than thoſe under the Belly, and terminate at other ſmaller Scales, which go on to cover the whole undermoſt part of the Head, and, beginning their ranks towards the ends before, continue them at the ſides of thoſe ranks as far as towards the bottom of the Jaws.

From the begining of the Neck unto the beginning of the Tayl, there are as many great Scales, as there are *vertebraes* or Joynts of the Back-bone; and as each *Vertebra* hath on each ſide a Ribb, each Scale meets by its two ends the points of both, and ſerves them for a defence and ſtay: the ſame abuts alſo on each ſide at the end of one rank of litle ſcales, wherewith the reſt of the Body is covered, and it ſeems, that 'tis placed there to receive them. Theſe ſmall ſcales are admirably well ranged, they lying upon one another, and repreſenting each as 'twere halfe a round towards their extremity. Their ranks appear

pear always ſloping, whether you look on them from the right ſide to the left, or from the left to the right; ſome what after the manner of the ranks of ſmall Slate, that are cut in a halfe round, in ſome places ſeen on the tops of houſes. Theſe Scales are more or leſs great, according as the part of the Body, they cover, is greater or leſſer. The Symmetry of them is always very exquiſite and even; and is ſutable to the great Scales, united to their ranks beneath. There are alſo obſerv'd on the top of theſe Scales, and all along the Back, many fine and diſtinct Lines, paſſing ſtreight along from the hind-part of the Head unto the end of the Tayl.

The Scales, that are under the Tayl from the beginning of it to the end, are divided, and yet they appear united and ranged in the middle by a very orderly and pleaſing compartment; and, their bigneſs goes diminiſhing in proportion with the Tayl.

The Skin of the Head is alſo covered with ſmall ſcales, and at the end of the Noſe turned up, and ſo on, even round about, as far as towards the Eyes, in the manner of a ſwines-ſnout.

There are obſerved only ſix openings in the

the Skin of a Viper: the biggeſt is that of its Throat; the other four are thoſe of the two Noſtrils, and of the two Eyes; the laſt is that, which is at the lower-moſt end of the Belly, where is the beginning of the Tayl, which incloſeth not only the hole of the Gut for voiding the excrements, but alſo thoſe of the organs of Generation, as well of Males as Females. This laſt opening is ſhut by the laſt of the great ſcales, which is advanc'd in the form of a half round, and opens in falling lower at the time of copulation, as it alſo doth at the time of the young Vipers being caſt, and of the excretion of their dung. The Throat opens and ſhuts at the will of the Animal; the Noſtrils remain alwayes open, and the Eyes have Eye-lids to cover them upon occaſion. There is no aperture in the skin to give any paſſage for Hearing; Nature, it ſeems, ſerving herſelf of the apertures of the Noſtrils for that purpoſe.

Vipers ordinarily caſt their ſcaly Skins twice a year, under which they are furniſht with another, quite formed, which at firſt appears much fairer, and of a more vivid colour, than that which is caſt off. And there is alſo inſenſibly forming an other

ther new one, againſt the time it is to ſerve, when that which now covers it ſhall be ſevered from it: So that a Viper hath at all times a double skin; and all theſe skins, though furniſht with ſcales, are notwithſtanding tranſparent, being held and look't on againſt the day-light.

This *External* deſcription might be ſufficient for thoſe, who ſhall deſire no more but to know how to diſcern Vipers from other Serpents, but the *Anatomical* Deſcription of all the parts under the Skin will be much more ſatisfactory and more neceſſary for thoſe, who ſhall deſire to know exactly all the good and all the ill in a Viper.

CHAP. III.

CHAP. III.

OF the Parts of the Head OF A VIPER

SECT. I.

Of the Noſe and Noſtrils.

BEginning at the extremity of the Head there are the *Noſe* and the *Noſtrils*. The former is made up of a Bone ſomewhat Griſtly, furniſht with ſome ends of Muſcles, that come farther off, and are accompanied with ſome ſmall veins and arteries. This Bone is alſo cover'd with the ſcaly Skin, turn'd up, as was ſaid above, at its extremities. There are two pipes, in the two ſides, that form the noſtrils, which have each a ſmall and round opening on the right and the left ſide, before, and the proper nerve, which coms down from

from the fore-part of the Brain unto their Orifice, and communicates to them the objects of ſmelling. The ſame Pipes ſerve alſo to receive two ſmall Nerves, which iſſue each from the lateral part of the Brain, and ſerve for Hearing. This griſtly Bone hath ſeveral Angles round about, and is articulated by two ſtrong Ligaments within and about the hollow and anteriour part of the Skull; which hinders not, but that it is a little flexible in this Articulation.

Sect. 2.

Of the Skull.

The *Skull* is found hollow in the fore-part of it, and repreſents the ſhape of an Heart in this Cavity, when the Bone of the Noſe is ſeparated from it. There are two points advancing, which in part embrace that Bone; it is in the ſuperior part ſurrounded with a ſmall border, advancing in the faſhion of a Corniſhe; it is notch'd on both ſides, where the Eyes are ſcituate, and there forms their round holes, of which the hind-part reaches out to a point, to which anſwers that before. The whole Skull in

all its parts is of a very compact and hard ſubſtance. There are three principal Sutures in the part above; the one, which may be call'd the *Sagittal*, which divides longwayes the part above the two Eyes; the ſecond, which may be term'd *Coronal*, divides the Skull a-croſs behind the two Eye-holes; the third, ſeparates it alſo croſs-ways near the beginning of the Back-bone. In the Surface of the upper part of the Skull, may be obſerv'd the figure of an Heart well repreſented, ſeated in the middle thereof, which hath its *baſis* near the Suture Coronal, and carries its ſharp end towards the hind-part of the Skull, which is ſever'd by the third Suture.

There is alſo another great Suture, round about the nethermoſt lateral parts of the Skull, by which it may be divided into two bodies, an upper and lower. This latter is made in the form of a turn'd back, going long wayes, hollow in the middle, and repreſenting the ſhape of a Culter, which hath a kind of little wing on its ſides, and whoſe point advances beneath the middle of the Eyes. Its latter part deſcends as far as the bottome of the Palate, where it hath in its lower part a point deſcending

deſcending in the form of an overturn'd hillock.

All the Sutures of the Skull are ſo well united in their conjunction, and ſo ſtrongly connected, that 'tis very hard to diſtinguiſh them, and yet more to ſeparate the parts of them without breaking them, unleſs the Skull be boyled in ſome liquor.

SECT. 3.

Of the Brain.

THe ſubſtance of a Vipers *Brain* is divided into five main Bodies, of which the two firſt are oblong, each of the ſize and ſhape of a grain of Succory-ſeed. They are ſeated long-wayes between the two Eyes; and 'tis from theſe Bodies, that the Olfactory Nerves do proceed. The three other are in the middle part of the Skull, and under that figure of the Heart, of which we have been ſpeaking. Each of theſe Bodies is near as big as a grain of the Seed of *Milium Solis*, and repreſents almoſt the ſhape of a Pear, the point of which is turned towards the fore-part of the Head. Two of theſe Bodies are ſeated in the up-

per part long-wayes, and one on the side of the other; the third, which is a little less, is placed under the middle of the two, and may be call'd the *Cerebellum*, or little Brain.

The *Spinal Marrow* seems to be the same body with this last, although it have a separate place in the hind-part of the Skull. It is of a substance somewhat whiter and softer than the Bodies, we have been just now speaking of, and of the size of a small grain of Wheat. It produces a Body of the same substance, which extends it self long-wayes, and passing in a strait line thorough all the *Vertebra's* or Joints of the Back-bone, terminates at the end of the Tayle.

The Bodies of a Vipers Brain are cover'd with a coat, thick enough, and sticking fast enough to them, which may be called the *Dura Mater.*: It is black, whence it hath hapned, that some Authors, not taking the pains to look under this Tunicle, have affirm'd, that Vipers Brains were black. Under this *Dura Mater*, each Body of the Brain, separately, hath also a little membrane involving it, which may be termed the *Pia Mater*. There are observed some small interstices betwixt these Bodies, and

even

even in the Body of the Spinal Marrow, which might paſs for *Ventricles:* And I doubt not, but that, if the Subject were a little bigger, we might obſerve in it moſt of the conſiderable parts, that are to be found in bigger Animals.

Sect. 4.

Of the Eyes, and their principal parts; as alſo of thoſe, that ſerve for Hearing.

The *Eyes* of Vipers are very quick, and their aſpect is exceedingly fixt and bold. They have their Nerves, Muſcles, Veins, Arteries, Apple, Chryſtallin, Uvea, Cornea, Eye-lids, and the other parts, like enough to thoſe of the Eyes of other Animals.

The moſt conſiderable Nerves are the *Optick*, which parting from behind both the Eyes, do meet together and conjoin laterally at the beginning of the Little Brain, and there make as it were the figure of an X, and opening themſelves after this conjunction, they encompaſs that little Body by the ſides thereof, and render themſelves at

the beginning of the Spinal Marrow, which receives them.

The ſmallneſs of all the other parts being ſuch, as that it maketh their examination difficult, and we having not been able to find any thing particular in them, I eſteem, that as it would be very troubleſome to make Reſearches thereof, ſo it would be to no purpoſe, to make a deſcription of them.

The two upper Bodies of the Brain ſend each from their lateral fore-part a ſmall Nerve, which piercing the Skull, runs along the Temples, where it joins it ſelf to the *Salival Glands* (whereof we ſhall ſpeak hereafter) and following them, it paſſeth under the Eye, where it divideth it ſelf into two branches, of which the chief inſerts it ſelf into the Bone and the Conduit of the Noſtrils, to ſerve for the Senſe of Hearing, and the leſſer deſcending towards the Teeth, called the Dog-teeth, it ends there, after it hath divided it ſelf into ſeveral branches.

SECT.

Sect. 5.

Of the Bones of the Head, that are jointed to the Skull.

On each upper ſide of the middle of that Heart, which is ſeen above in the Skull, there is a little flat Bone, a matter of a line and an half long, that is firmly articulated to it, which following and adhering to the ſame ſide of the Skull as far as to its hind-part, becomes to be articulated anew to another flat Bone, longer and ſtronger, and forming there as 'twere an Elbow. This latter Bone goeth downwards, and is ſtrongly jointed to the inward end of the lower Jaw; in the middle of which articulation, the upper Jaw terminates, and is there jointed, but not ſo firmly, becauſe it hath other articulations, which the lower hath not. Theſe Bones, which are like *Clavicles*, ſerve both for a ſupport to the Jaws, and to open and ſhut them; and for this purpoſe they are aſſiſted by the Nerves and Muſcles, which Nature hath provided them with.

There is also at each advancing end of the Eye-hole a little flat Bone, being about a line and an half long, which is strongly articulated with the root of the Dog-tooth, and by its other end is also firmly jointed to the middle of the upper Jaw, as well to support it, as to make it advance together with the great Tooth, when it is raised to bite.

The upper Jaw is divided in two, before, and is separated, by the gristly Bone, from the Nose, where its two ends are articulated on each side. These two Jaws are much more inward than those below, and the great Teeth are seated without their rank and at their side, tending outward, and do serve them for a defence. They are made up, each of one only Bone, that is about six lines long.

The lower Jaw is also divided in two. These Jaws are annexed, before, one to the other, by a Muscle, which opens or shuts them at the pleasure of the Animal; and they have no other articulation but that, we have spoken of about their inward end, *viz.* with the Clavicle coming down from the Skull, and with the inward end of the upper Jaws. Each of these

Jaws

Jaws is compoſed of two Bones, articulated together towards the middle of the Jaw; that which is before, embraces above and below that which is behind, and can bend it ſelf outward in this place, when the Viper will bite, and is a little curved inwards toward its extremity; and 'tis upon this Bone alone, that the lower Teeth are faſtned.

SECT. 6.

Of the Teeth.

THe Opinions of the Antients have been very differing about the number of the great Teeth of Vipers, and moſt have held, that in this the Female exceeded the Male, and that the plurality of the great Teeth was the chief mark, whereby to diſtinguiſh her from him. I have been careful to inform my ſelf about it, and have taken pains to grovel with a great deal a patience in the gums of innumerable Vipers; but all being well examined, I have not found, as to this point, any true difference of one Sex from the other, but ſometimes more, ſometimes leſs Teeth in one and the other.

other. I have caſually met on each ſide with two great Teeth fixed, placed very near together, and on the ſide of one another, as well in Males, as Females; but in moſt of both Sexes I have found only one, fixed on each ſide, cover'd, to two thirds of their height, with a Tunicle or Bag ſufficiently thick, fill'd with a yellowiſh juyce, which is tranſparent and pretty fluid; and in this Veſicle, in the midſt of this juyce, and under the great and main Teeth, a differing number of Teeth ill ſet, ſome longer than others, and all hooked, of which I have counted, in ſeveral Vipers, from two to five, ſix and ſeven, on one and the ſame ſide, under the ſelf-ſame Tooth, and in the ſame Bag.

Theſe great Teeth are only in the upper part, ſtanding on the ſide, and without the Jaws of the Animal, where they are like Bulwarks. They are about two lines long, hooked, white, hollow, and diaphanous throughout, as far as to their ſharp point, which is very ſubtle and exceedingly piercing. They have many little Cavities towards their Root, in which the other Teeth are planted. Theſe Teeth commonly remain lying along the Jaw, and their

their point appears not but at the moment the Viper will bite; for then it raiſeth them, and advanceth them jointly with the upper Jaw, drawn by the Bone, which at one end is articulated in the middle of it, and at the other, to the root of the great Tooth.

The yellow liquor, contained in the Veſicle, ſerveth not only to moiſten the ligaments, and to make them fit for the bending of the Teeth, but alſo to nouriſh them, and to make thoſe grow, that are there as 'twere in a Nurſery, and are, if we may ſay ſo, in expectation to ſerve inſtead of the many Teeth, whether theſe come to fail in their force, or fall out of themſelves.

All the Jaws, both upper and lower, are fortify'd with bent Teeth, that are hollow, pellucid and ſharp, as the bigger Teeth, but that they are much ſmaller. Their number is uncertain enough, whether it be, that Nature produces ſometimes more, ſometimes leſs of them, or that that fineneſs maketh them apt to break. There is little difference, as to the number, in thoſe above from thoſe below. Ordinarily there are eight Teeth in each Jaw, but at times I have found nine, ten, eleven in each. Thoſe

that

that advance moſt, are a little bigger than the deepeſt; and juſt as thoſe below anſwer in ſcituation to the Dog-teeth, that are above them, they have at the end of each ſide one Tooth, that is a little bigger than all thoſe of the other Jaws, and another, leſſer, at the ſide, at the end of the part bent inwards.

There is a great difference in the Teeth and Jaws of Vipers, from thoſe of Snakes: for, *theſe* have no Dog-teeth; and although their Jaws are all divided in their foremoſt part like as in Vipers, yet they exceed them in the number of Jaws, and in the number of Teeth; for, they have four Jaws above, and two below; two of thoſe above are ſituated all along and cloſe to the rim of the Lip, and ſerve for a defence to the two other Jaws, that are ſeated in the ſame place, where thoſe in Vipers are. Beſides, I have counted 13 Teeth in each exterior Jaw above, and as many in each of the Jaws below, and 20 in each ſuperior inward Jaw; ſo that I have counted of them to 92 Teeth in one Snake, and all theſe Teeth are bent, fine, hollow, white and tranſparent, like thoſe in Vipers.

SECT.

SECT. 7.

Of the Nerves, Veins, Arteries and Muſcles of the Head in general.

THE chief Nerves in the Head of a Viper are, firſt, thoſe of which we have ſpoken, namely thoſe of the Smell, the Sight and the Hearing. Beſides, there are *thoſe* of the Taſte, that which may be call'd the ſixth *par vagum*, which is afterwards diſtributed into all the vital and natural parts; and *thoſe*, which iſſuing from the Spinal Marrow are carried through the whole habit of the Body. There are alſo many Nerves, that go from the inferiour part of the Brain, and paſs through the Skull, but by reaſon of their ſubtility and fineneſs, 'tis hard to follow them to their inſertion.

There is yet another Nerve that is conſiderable, which proceeds from the Skull, behind that of Hearing, which leaves, in the ſpace between, a ſmall *Apophyſis*, or Proceſs, or Knot, in the Skull, and which, deſcending along the Clavicle, runs upon the ſuperiour Jaw, and is inſerted in its middle; then

then it goes on in the middle to its extremity, and distributeth it self into all the Teeth, fix'd there.

The Head hath also its Veins and Arteries, which coming from the Liver and the Heart, distribute themselves there into an infinity of branches, by which all those parts are bedew'd. It is also provided of many Muscles, at the sides and below the Skull, and about the Clavicles, and superiour and inferiour Jaws, that serve not only to fill up the Cavities of the Skull, and to cover the Bones that are articulated there, but to give motion to all the parts that need it: to which also the Nerves contribute their share.

Sect. 8.

Of the Salival Glands of a Viper.

The Opinion of the Antients, That the seat of the Vipers poyson was the *Gall*, and that from thence it ascended into the Gums, by vessels odly enough fancied, hath seem'd to me too far from all probability to follow it. I therefore thought, that that particular did very well deserve

deſerve a ſtrict enquiry, and that it was of moment to diſcover the Truth thereof. On the other ſide, the curious Obſervations, made on this Subject by Signor *Redi*, a Florentine Philoſopher, whoſe merit is known and eſteem'd by all the Learn'd, ſeemed to me, as to all thoſe that have ſeen and examin'd them, not only reaſonable and poſſible, but I was altogether perſwaded of the candor and ability of that illuſtrious perſon. Upon his Accompt and Relation, I never ſcrupled to taſte often of the gall of Vipers, as well as of the yellowiſh liquor, contained in the bags of the Gums; and I have found in both the Truth of what he hath obſerved thereof, namely a great bitterneſs, and a great ſharpneſs in the Gall; and the taſte of a *Saliva* or Spittle ſufficiently flat, and approaching enough to the taſte of the Oyle of ſweet Almonds, in the yellow Liquor of the Gums.

Theſe great differences of the qualities in the one from the other, made me believe that there was a great diverſity in the matter of them, as well as in their ſource; and I believed at firſt, following Signor *Redi*, that there might be *Salival* Veſſels in Vipers,

pers, as there have been lately found in Man, and divers other Animals; so that after many researches, made with attention and patience enough, in many Vipers Heads, I discover'd at length such *Glands*, proper to form this juyce, and to convey it to the Gums; and after I was well perswaded of it my self, I shew'd them to divers of those knowing Physitians, that had met at my House the last Year. These persons had a mind to see with their own Eyes, and after they had well examin'd the parts which I shew'd them, they not only found them true, but they there also saw a greater number of smaller vessels, than had appear'd to me, of which some, that are Arteries and Veins, pass above the *Glands*, and others, that are *Lympheducts*, run below: so that they judged, that I could confidently assert and describe these *Glands*, which I call *Salival*, and which they had acknowledged together with me; though Signor *Redi* durst not speak *positively* of them, because he had not discover'd them, neither had they been described by any Author of their knowledge, nor by any one of mine.

These

These *Glands* are found in all the Heads of Vipers, both Males and Females; they are seated on both sides, and joining to the Skull, in the hind-part of each round of the Eyes, and at the same height with them. There are many small ones join'd together, which may be call'd *Conglomerate Glands*, which are easily distinguishable by their form and colour, which is different from the Muscles, neighbouring to them, and of which there is one, that may be call'd *Temporal*, which in part covers them by its extremity. This heap of *Glands* appears there of the bigness of the neighbouring Eye, and extending it self in length, continues its progress in the Orbite of the Eye, below, and in part behind the Eye. Each *Gland* hath its little Lymphatique Vessel, which parts from it as from a little Teat, and goes disgorging it self into a greater Vessel, that runs all along and under these *Glands*, and passeth into the Vesicle of the Gum, and terminates in the midst of the Articulation, which the root of the great Teeth maketh with the advancing corner of the said Orbite, and with the little Bone, which by its other end is articulated in the middle of the upper Jaw. This

principal veſſel, which, being conſidered alone, is very little in appearance, but is not ſo in effect, ſeing it receives the diſcharge of all the ſmall veſſels, that come from each *Gland*, empties it ſelf into the Bag of the Gums, and carries thither that *Salival* Juyce, which may have qualities approaching to thoſe of the *Saliva* or Spitle of man, or of the foam or drivel of divers other Animals.

The Nerve, which ſerves in the Noſtrils for the faculty of *Hearing*, runs for ſome ſpace along theſe Glands, which are alſo, as I have already ſaid, ſmal Veins and Arteries.

But having well conſidered the ſubſtance, quality, and ſituation of theſe *Glands*, we judged their formation not to be in vain; but that their Uſe, in all likelyhood, was to receive the humidities both of the Brain, the Eyes, and the neighbouring parts; and that their diſcharge was very convenient and even very neceſſary to the parts, which receive that liquor, as well for moiſtening the ligaments of the great Teeth, and to keep them in a condition of bending, at ſuch time when the Viper will bite, and to increaſe the

Teeth,

Teeth, which Nature hath made and ſet in the midſt of this Juyce.

For the reſt, examining and taſting the *Glands* as well as the Juyce, we found a Taſte altogether like that of the Gums, which Signor *Redi* hath deſcribed, namely very near the taſte of the Oyle of Almonds, without any bitterneſs, though it leave, a while after, a little acrimony in the mouth, ſuch as may be diſcerned in all kind of Spitle.

As to the ſmall *Glands*, which Signor *Redi* hath obſerved at the bottom of the Veſicles that contain this Juyce, I can ſay, that I have with great care and diligence ſearched them, and that, 'tis true, I have there found the appearances of Glands, but having opened them, I ſaw nothing in them but ſmall teeth which were faſtned there, and are of the number of thoſe, which I have called *Expectants*, without finding any thing of a Glandular nature there, nor that did, in the leaſt, approach to the ſhape, ſubſtance or qualities of the *Glands*, which I have been deſcribing.

The Viper is not the onely among Serpents, that hath *Salival Glands*; for I have

alſo found of them in the Head of Snakes, which Glands were heaped together longwayes, and ſcituated near each outward upper Jaw, ſerving them for a defence, in a manner, as the Dog-teeth do to Vipers.

T eſe conſiderations, ſupported by many Experiments, made by u ,and to be related hereafter, have induced me to call theſe Glands *Salival*, and to aſcribe to them the very ſource of that yellow Liquor, which hath been ſo much decryed, and with-all ſo little known, and is nothing elſe, but a pure and very innocent Spittle. I hope, that thoſe, who ſhall take the pains of carefully examining, after me theſe *Glands*, and this juyce of the Gums will not ſtick to give me their ſuffrages.

CHAP

CHAP. IV.

Of the other Bones of a VIPER, *and the principal Parts, thence depending.*

THe great number of Bones, which reſt in the Body of a Viper after thoſe of the Head, conſiſts only in the *Vertebra*'s or Joints of the Back-bone, and the *Ribs*. Theſe Joints begin at the hind-part of the Skull, to which the firſt is articulated; the other are ranged conſecutively, ſtrongly joined to one another, and they continue to the end of the Tayle. Every Viper, both Male and Female, hath an hundred and forty five *Vertebra*'s, from the end of the Head to the beginning of the Tayle, and Two hundred and fourſcore and ten Ribs, which is the double number of the *Vertebra*'s; to each of which there are articulated two Ribs, one to each ſide, which are bent, and do

embrace the vital and natural parts of a Viper, and each point whereof rendevouſes at one of the ends of the great Scale under the belly, which is fit for both; ſo that there are as many great Scales under the belly, from the end of the Head unto the beginning of the Tayle, as there are *Vertebra*'s, conſorted by their two Ribs: Beſides that, there are twenty five *Vertebra*'s from the beginning of the Tayle to the end thereof; and thoſe *Vertebra*'s have not any Ribs, but, inſtead thereof, little *Apophyſes*, or Proceſſes, which leſſen in their magnitude, as the *Vertebra*'s do, tending towards the extremity of the Tayle.

There are four great Muſcles, very firm and very long, which take their origine from the hind-part of the Head, and deſcend, two of them on each ſide of the Spinal Proceſſes, one joining to the Spine, and the other to the ſide and a little below the firſt, which it accompanies all along unto the end of the Tayle. There are alſo two great Muſcles of the like length, which are faſtn'd to the inferiour part of the *Vertebra*'s, and accompany them from one end to the other, as well as the ſuperiour ones. We alſo obſerve, on each ſide, as many intercoſtal

tercoſtal Muſcles, as there any *Vertebra's*, ſerving for the ſame uſe, that thoſe of other Animals do, which ſever the Ribbs from the place of their root unto their point. All theſe Muſcles are alſo accompanied with veins and arteries, as well as the greateſt.

CHAPT.

CHAP. V.

Of the other Internal parts of a Viper.

SECT. I.

Of the Tongue.

THE *Tongue*, which the Viper darts out and draws in often and very quick, preſents her ſelf firſt of all. She is placed between the two Jaws below, and compoſed of two Bodies, fleſhy, long and roundiſh, and terminating in very ſharp and flexible points. Theſe two Bodies are contiguous, and adhere to one another all along, from the place of their root as far as to the two third parts of their length. The inward half of theſe Bodies is of the colour of fleſh, but the other half, I mean that which is often thruſt out, is of colour blackiſh.

The Tongue may be, in all, an inch and an half long. Its root begins half an inch lowe

lower than the bottom of the Throat; and 'tis firmly annex'd, below the Neck, to two tendinous bodies, which are two or three lines long.

There are ſome Vipers, whoſe Tongues have three points, and ſome alſo, that have four. Theſe points, though often darted out, prick not, nor hurt any body; though perhaps they may frighten the ignorant. They chiefly ſerve Vipers to catch theſe ſmall creatures, which they have a mind to devour. The Tongue is envelop'd by a kind of ſheath from one end to the other.

SECT. 2.

Of the Wind-pipe and the Lungs.

THE *Wind-pipe* hath its beginning at the entrance of the Throat, where it preſents a hole in an Oval, raiſed on high, and having as 'twere a little beak in its lower part. It is compoſed, at its entrance, of many griſtly rings, joyned to one another; which continue about the length of a good inch, and fall into the right ſide of the Viper, where they meet with the Lungs; and from that place you ſee no more but the half

half rings turn'd upside down, which being joyned on both sides to the membrans, that depend from the Lungs, and which are annexed to it below from one end to the other, being assisted by the said Lungs, serve for Respiration, and continue their rank and their connexion, as far as to the fourth part of the Liver, which lies under it; as well as the Heart. The Winde-pipe is in all eight or nine inches long; and at the place, where its half rings end, it is united with a membrane, which attracts and receives the Air, as far as to the beginning of the intestins, where it forms, as it were, a roundish bottom of a sack.

The *Lungs*, being joyn'd to the Wind-pipe, and making with it one Body, are consequently situate, as it, on the right side. They begin, where the whole rings of the Winde-pipe do end. They are made in the form of a Net; they have no Lobes at all; they are red, very clear and very vivid, of a substance fine enough, sufficiently transparent and a litle rough. They are fastned by Membrans to the upper part of the imperfect rings; being seven or eight inches long, and about one inch broad; and all over embroidered with veins and arteries.

SECT.

Sect. 3.

Of the Heart, and the Liver.

The *Heart* and the *Liver* are alſo ſeated on the right ſide of the Viper; and before the Heart there is, about the third part of an inch, a little fleſhy and flattiſh body, of the bigneſs of a little pea, which is filled with water; this little body is placed under the Lungs as well as the Heart and the Liver, and is ſuſpended by the ſame membrans, which ſupport it: it may be taken for a kind of *Thymus* or kernel, and may ſerve for the ſame uſes.

The *Heart* is ſeated about four or five inches below the beginning of the Lungs; of the bigneſs of a ſmall beane: it is ſomewhat long, fleſhy, and encompaſſed with its *pericardium*, which conſiſts of a ſufficiently thick tunicle. It hath two Ventricles, one on the right, the other on the left ſide: it alſo hath two apertures. The Blood, which comes from the *vena cava*, enters into the right ventricle, and being paſſed into the left, iſſues thence by the *Aorta*, which preſently is divided into two great branches,

branches, one of which aſcends into the upper parts, and the other, paſſing below the *Oeſophagus* or Weſand, and taking its way ſloping, ſubdivideth it ſelf afterwards into many other branches, which ſpread themſelves and are carried to all the parts, to the very end of the Tayle.

The *Liver* is a fleſhy part, of colour red-brown, ſeated half an inch beneath the Heart, and ſupported by the ſame membrans: its length and breadth are unequal enough, but the greateſt Livers, I have ſeen, are five or ſix inches long, and half an inch large. It conſiſts of two great lobes of which the right deſcends a good inch lower then the left. Theſe two lobes are bedew'd by the *vena cava*, which ſeems to ſeparate them all along into two bodies, and which makes even a ſeparation in their lower half, running in their interſtice, and ſerving to joyn them together in one body: The upper half of the Liver is continued, and cannot be divided but by cutting it aſunder.

The Trunk of the *vena cava* is divided into two branches in its upper part, of which the main and biggeſt endeth in the Heart, and the other paſſeth under the Lungs,

Lungs, and from thence into the ſuperiour parts. This Vein in its inferiour part is divided into many branches, which deſcend into all the parts below.

A Viper is deſtitute of a *Diaphragme*, there being no ſolid traverſing tunicle at all, that ſevers the vital parts from the natural: yet it may be ſaid that that fine tunicle, which depends from the Wind-pipe and the Lungs, and goes down towards the Inteſtins, and there forms, as 'twere, the ſhape of a ſack-bottom, may in ſome manner peform the function thereof.

SECT.

SECT. 4.

Of the Gall, and the Pancreas, which the Antients called the Spleen.

THE *Bladder of Gall* is ſituate an inch below the Liver, and on the ſide of the bottom of the Stomack, and it leans to the left ſide. It is almoſt of the ſhape and bigneſs of a ſmall Bean lying flat.

The *Gall* is very green; its taſte very bitter and ſharp; its conſiſtence approaching to that of a Syrup not much boyled.

I have found in the Bladder of Gall but one out-let by a ſmall veſſel, which iſſuing from the inward ſide of its upper part, is bent from its origine, and deſcending, and adhering, even in its beginning, to the internal part of this Bladder, is afterwards divided into two branches, of which the principal and directeſt, paſſing through that Body (which the Antients have taken for the *Spleen*) runs into the Inteſtin, which receives it; and the other leſſer branch, turning about, ſeems to remount to the Liver, but dividing itſelf into many ſmall branches, becomes ſo indiſcernable, that it cannot be followed any longer. It

It is not here, that I will refute the opinion of the Antients concerning the Venomous quality they have aſcribed to the Gall; I leave that for another place, where I ſhall endeavour to maintain the Balſamique quality of this Juyce, and ſhew, that 'tis free from all kind of poyſon.

The *Pancreas* or Sweet-bread, which all Authors have called the *Spleen*, is placed near and a very little below the Gall, and on the right ſide of the Viper. It is of the bigneſs of a good Pea, of a ſeemingly fleſhy ſubſtance, but indeed Glandular. Conſidering its ſituation, (which is cloſe to the bottom of the Stomach and towards the entry of the Guts) together with its kernelly ſubſtance, it maketh me believe, that 'tis rather a *Pancreas* than a *Spleen*: but yet I leave the deciſion of it to thoſe, who ſhall take the pains to examine it.

SECT.

Sect. 5.

Of the Oesophagus or Weasand, and the Stomach.

The *Oesophagus* takes its beginning at the bottom of the Throat; its situation is on the left side, and its passage directly on the side of the Lungs and the Liver, as far as to its union with the orifice of the Stomach. It is made up of one onely membrane, very soft, and easy to be extended, and which may be swell'd even to the bigness of two inches. It is this part, which first receives the animals, the Viper hath killed with its great teeth, and swallowed whole, it being proper for that purpose, both by its large capacity, and by its length, which is of a good foot.

The *Stomack*, which is next, is as 'twere sowed at its bottom, and seems to make but one Body with the *Oesophagus*; but yet is much thicker, and composed of two strong coats, one within the other, and sticking to one another. The thickness of its coats makes, that it cannot be swell'd to the same bigness with the *Oesophagus*; for

for it cannot much exceed the bigneſs of an inch. It is between three and four inches long; its orifice is ſufficiently large, as well as its middle, but the bottom of it grows ſtreighter, and is commonly very cloſe and firm, not opening it ſelf, but to eject its excrements into the Gutts. Its internal tunicle is full of rugoſities when 'tis empty, and in it there are very often found little worms of the length and thickneſs of ſmall pins. The Stomach is ſeated on the left ſide, as the *Oeſophagus*; but the bottom of it is turned towards the middle of the Body, to empty itſelf into the firſt Gut.

The length and capacity of the *Oeſophagus*, and the largeneſs of the entry of the Stomach, are very well accommodated to the nature of the Viper, which ſends nothing chew'd to the Stomach, but ſwallows Animals whole for its food; and when ſome of them happen to be longer than the depth of the Stomach, part of them ſtayes in the *Oeſophagus*, untill the Stomach have extracted and ſent away the juyce of the parts devoured, which it could hold; after which it receives thoſe that ſtay'd in the *Oeſophagus*. But this requires a good ſpace

of time, in regard that the Stomach is not closed, and cannot gather any considerable heat to make a speedy digestion.

Sect. 6.

Of the Intestins, kidneys, Fat, and a Tunique wrapping them up below.

THE *Intestins* of Vipers are situate in the midst of the Body, under the Back-bone, and immediately after the bottom of the Stomach. I have onely observed three of them, of which the first and narrowest may be called the *Duodenum*; the second, which is larger, and full of many windings, may be called the *Colon*; and the third and last, the *Rectum*, which also is very large and very streight; and hath its aperture below and near the beginning of the tayle, at which the Excrements pass away.

These Intestins have, at their sides, *Testicles*, together with their vessels, both of the

the Males and Females, and the two bodies of the *Matrix* of the latter, which we ſhall ſpeak of hereafter. They contain alſo the *kidnys* with their veſſels, which part from thence, and are accompanied of their veins and arteries, as alſo all veſſels ſerving for generation; and the Inteſtins themſelves are not deſtitute of them.

The *kidneys* are placed below the Teſticles; they are made up of many glandulous bodies, contiguous, and ranged longwayes, one after another. They are commonly two inches and an half long, and two lines and an half large upon the round, which is a little flat. They are of a pale-red colour. The right kidney is alwayes ſeated higher than the lower in both ſexes. They have alſo their *Ureters*, at which they diſcharge the ſeroſities near the extremity of the Inteſtin.

All the Inteſtins, the Teſticles, and the kidneys are covered with a very white and very ſoft *Fat*, which being melted hath the form of Oyle. At times alſo there is ſeen in ſome Vipers a little Fat about the Heart, the Lungs, the Liver, but eſpecially cloſe to the Gall, and near that part, which ſome take for the *Spleen*, and others

for the *Pancreas*. All these parts are wrapped about with a strong Coat, that is firmly fastned to the extremities of the Ribbs, which might pass for the *Epiploon*, if the Fat were joyned to it: but as the Viper, which is a kind of Serpent, passeth not but among the imperfect animals, I shall not determine the name of this Tunique, to which the more Intelligent may give what name they shall think most proper.

CHAP.

CHAPT. VI.

Of the parts of Vipers, that ſerve for Generation.

SECT. I.

Of the Parts of the Male.

THE Male hath two Teſticles, which are ſomewhat long and roundiſh, and ſharpen a little toward both ends. Their colour is white, and their ſubſtance glandular. Their length is unequal, the right being longer by an inch, than the left, and this alſo ſomewhat leſs in thickneſs. They are not thicker than the quill of the wing of a great Capon. Their ſituation is different; for, the right begins near and beneath the Gall, whereas the left begins about eight lines lower than the right. They are both ſuſpended in their upper part by two ſtrong membrans, coming from below the

Gall, and are ordinarily covered with fat, which maketh them hardly discernable, by reason of the likeness of colour they have with this fat.

From the midst of each of these Testicles, from the inward part, one may see issue forth a little Body, long and slender, solid enough, and even somewhat whiter than the substance of the Testicles, which descends, and is fastned to them all along as far as to their lower end. It may be called the *Epididymis*. There appears at the end of each, the beginning of a small straddling vessel, that may be called *spermatique* because of its office; which is a little flat, very white, and shining enough, and commonly filled with seed, having the form of a milky juyce. This vessel is sufficiently delicate, and winds in its passage, after the shape of many S's joyned together, very pleasant to behold. From thence it descends between the Intestin and the kidney, whose *Ureter* it follows unto the hole of the last Gut, at which the Excrements pass away. It is also accompanied of veins and arteries from one end to the other, as well as the Testicles, and it ceaseth to be winding a little before it comes to the aperture

ture of the Gut. Each of theſe two ſpermatique veſſels comes to rendevouſe at its proper receptacle of ſeed; of which there are two, that may be called *Paraſtates*, which are like white kernels, each of the length, bigneſs and ſhape of a grain of *Carduus benedictus* ſeed. Theſe kernels are ſeated longways below and between the two natural parts: they are always full of a milky juyce, and altogether like that of the ſpermatique veſſels, juſt now deſcribed: and to furniſh for ejaculation at the time of the *Coitus*, they tranſmit the ſeed, which they contain, into the ejaculatory pipes of the two natural parts, neighboring to them.

I may ſay on this occaſion, that thoſe who have taken theſe two Conſervatories of ſeed for other Teſticles, have much deceived themſelves in the opinion, they have entertained, that, there being two natural parts, there muſt alſo be for each of them two teſticles: But their ſubſtance being quite different from the true teſticles, by us deſcribed, and their office being to receive, and not to form, we do not acknowledge them but for *Paraſtates*, which by little and little receive the Seed, ſent thither by the Teſticles, and reſerve

ſerve it, and keep it ready for the time of copulation, and to perform that in a moment, and ſeaſonably, what the ſpermatiqne Veſſels would not be able to execute ſo ſoon, nor ſo well, becauſe of their length and windings.

The Male hath two *Penes's* altogether alike, which being pulled out are each as long as the Tayl of the animal. Their origine cometh from the extremity of the Tayle, under which they are ſeated all along, the one by the other. They go increaſing in bigneſs, as the Tayle does; at the beginning of which they end, and they have their iſſue near and at the ſide of one another, and cloſe to the opening of the Inteſtin, which maketh in a manner their ſeparation.

Each of theſe is compoſed of two long and fiſtulous bodies, ſeated together one by the other, and which joyn towards their top in one body, which is environed with its prepuce, and hath its Muſcles *Erectors*, as many other Animals have. Theſe parts are within full of many ſtings or pricks, very white and hard, and very ſharp, ſo ſet, as that they have their ſharp end variouſly turned; of which the bigneſs and thick-

neſs

neſs anſwers to the place of the natural part, where they are ſet, ſo that as the top is bigger and thicker, the ſaid ſtings are ſo too; and they advance and appear not but when the prepuce, which covers them, ſhrinks down at the time of the animals diſpoſition to the coit.

Theſe natural parts are ordinarily hidden, and they ſwell not, nor come forth, but for the coit; unleſs it be, that, the animal being taken, they be forced out by preſſing them; for in that caſe one may ſee them both come forth equally, each about the thickneſs of a *date*, and of the length of two thirds thereof, and their top is altogether covered and quite beſet with theſe pricks, like the skin of a Porcupin; and theſe ſtings retire and hide themſelves under the prepuce, when one ceaſeth to preſs them.

The iſſue of theſe two parts is environ'd with a very ſtrong and thick Muſcle, to which the skin is firmly faſtned, and in ſuch a manner that it is very difficult to ſeparate it therefrom: which ſame Muſcle ſerveth alſo to open and ſhut the Inteſtin.

SECT.

Sect. 2.

Of the parts of the Female Viper, that ſerve for Generation.

THe Femal Viper hath two Teſticles, as the Male; but they are longer and bigger. They are ſeated on the ſides and near the bottom of the two Bodies of the *Matrix*, and the right is higher than the left, as 'tis in Males. Their Subſtance and colour alſo are very like them. The right is about one inch and an half long, and two lines and an half large; the left is ſomething leſs. They have their *Epididymis*, and their Spermatique veſſels, that convey the ſeed into the two Bodies of the *Matrix*, and which are much ſhorter than thoſe of the Males. Yet I obſerve, that theſe Teſticles appear not always ſuch in all Females, eſpecially in thoſe that are emaciated, either by ſickneſs, or by long keeping; for, their Teſticles ſhorten, ſtreighten, and dry, like as in thoſe, whoſe Eggs are already great; having obſerv'd, that in theſe the Teſticles are much ſhortned and dryed up, as alſo that they are deſcended lower,

al-

although the right be alwayes found higher than the left.

The *Matrix* begins in a body pretty thick, which is compos'd of two ſtrong tunicles, and which being ſeated above the inteſtin, hath in the ſame place its orifice, which is large, and doth eaſily dilate, to receive at one and the ſame time, by the ſame aperture, the two *Penes*'s of the Male, in the Copulation. This Body is about the bigneſs of a nail of a middle-ſized finger, and is divided very near its beginning into two ſmall baggs open at the bottom, and fram'd by Nature to receive and embrace the two members of the Male in the coit. Their interiour coat is full of rugoſities, and very hard, as is that of the whole body, which we have ſpoken of; ſo that ſhe ſuffers, and alſo feels pleaſure from, the pricking of the little ſtings of the Male's members, without being hurt thereby, although their points be very ſharp.

The *Matrix* begins by theſe two little ſacks or baggs to be divided into two bodies, which aſcend each on its ſide along the kidneys, and betwixt them and the inteſtins, as farr as to the bottom of the Sto-

Stomach, where they are ſuſpended by ligaments, which come from about the Liver, being alſo ſuſtained, from ſpace to ſpace, by divers ſmall ligaments, that come from the Back-bone. Theſe two bodies are compoſed of two tunicles, that are ſoft, thin, and tranſparent, being one within th' other, Their beginning is at the bottom of thoſe two ſmall bags, which embrace the two members of the male, from whence they receive the ſeed each from its ſide, to breed Eggs of it, and ſo young Vipers, by the conjunction of their own ſeed, which the teſticles ſend thither.

Theſe two Bodies of the *Matrix* do very eaſily dilate themſelves, that they may contain many young Vipers, unto the time of their perfection: notwithſtanding the opinion of ſome, who have affirm'd, that the *Matrix* of a Viper had but one onely body; that it was ſeated in the midle, and all along the Back-bone, and that there were in it diſtinct Bodies to hold the Eggs, and the young Vipers, which bodies were dependants of this *Matrix*. But, I believe, that the ground of their miſtake hath been, in that thoſe true bodies of the *matrix* being very delicat and very tranſparent, eſpecially

cially when they are ſwell'd and diſtended by the Eggs, or the Vipers, by them contained, have not paſſed in their opinion for true bodies of the *Matrix*, and that they have taken for it the inteſtins, which are ſeated in the middle, and appear pretty bigg and thick, and ſeem to make but one and the ſame body with the firſt thick body of the *matrix*, under which the beginning of the firſt inteſtin is faſtned and ſeated.

The Viper is not the onely animal, that hath her *matrix* divided into two like Bodies, equally placed each on its ſide, and along the Guts, which ſeparate them; for I have obſerv'd the ſame thing in many *Snakes*, which I have open'd purpoſely to know the truth hereof.

SECT.

Sect. 3.

Of the Generation and Production of young Vipers.

BY the particular description, we have made of the parts serving the Viper for generation, is is easy to renounce all the Fables we finde in Books, concerning the copulation of Vipers, and the production of the young Vipers: so that I shall not trouble the Reader any further with them, but onely intimate, That by the means of the insertion of both members of the Male into the two baggs of the *Matrix*; by the ejaculation of the Seed, made of them both together, into the two bodies of the said *Matrix*, which are united at the bottom of the baggs; and by the concurrence of the Femals own seed which her testicles emit at the time of the coit; the Eggs are first formed in both the bodies of the *Matrix*: that each is covered by its little tunicle; that the Eggs of each body of the *Matrix* are altogether wrapped up in one common membrane, commonly

monly called the *Ovarium*; that all is inclosed in its proper body, the *Matrix*; that the Eggs there take their increase; that the young Vipers are there formed and perfected; that thence they come forth one after another by the same passage, where the seed of the Male went in; and that they are produc'd alive, as many other animals, without any need of the intervention of the dam's death.

We can assure the truth of all these particulars, having verified them by an accurate examination of all the parts, at several times, and upon a great number of subjects; and having seen the extension and swelling of those two bodies of the *Matrix*, even at the time when the young Vipers were perfected and ready to come forth; and lastly having seen the passage free, by which they were to come abroad, and the young ones actually produced without any danger to the Dam.

We have noted, that the right body of the *Matrix* of the Viper is ordinarily fuller of Eggs and young brood, than the left; that the number of Eggs is pretty unequal; that at times there are twenty or twenty five, sometimes but half so many; that the young

young Vipers take their form and perfection in the Egg; that there they are seated and entangled divers wayes, and after a very pleasant manner; that they have each within their Egg a kind of after-birth depending from their Navil, by which they draw their food; that in coming abroad they train it after them, and in part are encompassed with it; and that their Dam frees them thereof, and cleanseth them by licking them when they are born.

But although we have, as exactly as we could, described all the inward and outward parts of a Viper, both of a Male and Female; yet to the end that all may be the better understood, we shall address the Reader to the following Schemes, wherin he may see the same parts, we have just now described, represented and drawn to the life, together with their explication in the *Tables* accompanying them; hoping, that he will there find satisfaction.

The Reader is desired to take notice, that having on the Frontispice of this Book represented two Vipers, *a Male and a Female, conjoyned* tempore coitûs, *and there being in the exteriour part of their Body no considerable difference in the one from the other, but in their Tayle, of which the representation may be seen separately in the* second *Figure; I thought it needless, to exhibit the whole Figure of a* Male *by it self; and have contented my self to have engraven the* Female *in the state she is at the time when she produceth her young ones, which is that, which seem'd to me the most considerable for her exteriour Figure.*

He will also find no fault with the Situation, *in which the* Viper *is represented in the Cutt, at the time when her young ones come forth, since that besides the Symmetry, which hath been there industriously observ'd, it was also intended to shew therein the parts, that seem'd very necessary to me, and that could not be represented elsewhere.*

The EXPLICATION *of what is represented in the first Scheme.*

A A A. The Female Viper, bringing forth her young Vipers, exhibiting the lowermost part of her Body; where you may see the great Scales, on which she creepeth.

B B B B. Four young Vipers, each in one of the corners of the Cut, appearing wreathed, and in the same posture and situation, wherein we have seen them alive and ready to come forth; two of which appear without cover, one cover'd with its Coat, and the other having a piece of its After-birth depending from its Navel.

C C C C. Four other young Vipers, within the round, which the Viper formeth; one of which appears creeping, and clear of its Secundine; the other having it yet depending from its Navel; the third coming forth and training along with it the Secundine; and the last wrap'd about by it, and in the state, wherein it was, when ready to be born.

D D. A part of a Female Viper, repreſented open under the belly long-wayes, and turned upſide down, from the place of the Gall, unto the Orifice of the *Matrix.*

E. The Gall.

F. The Pancreas or Sweet-bread, which many have taken for the Spleen.

G. The bottom of the Stomach.

H. The beginning of the Inteſtins.

I. I. I. The Eggs contain'd in the two bodies of the Matrix, but being found in a far greater plenty in the right, than the left body.

K. A part of the laſt Gut.

L. The Orifice of the Matrix, and of the Gut.

M M. The two little Baggs, which join to the beginning of the two bodies of the *Matrix.*

N N. A part of each of the Kidneys.

The EXPLICATION *of what is represented in the second Scheme.*

A A. The first half of the body of a Male Viper, flead, turn'd upside down, and open under the belly from one end to the other, containing

B B. The Wind-pipe.

C C. The Lungs.

D. The Thymus or Kernel.

E. The Heart.

F. The Liver.

G. The great Vein, call'd *Vena cava.*

H H. The *Oesophagus* or Weasand.

I. The ascending branch of the *Aorta.*

L. The descending branch of the same Artery.

M. The Stomach.

N N. The other half of the Body, in the same condition with the first, containing

O. The bottom of the Stomach.

P. The bladder of Gall.

Q. The Pancreas, or, according to some, the Spleen.

R R R. The Intestins.

S S. The Teſticles, together with their *Epididymis.*

T T. The Spermatick Veſſels.

V V. The Kidneys.

a a. The Tayle of a Male, to which are annext the parts that follow.

b b. The two members of Generation, as they come forth at the time of the Coit.

c c. The two *Paraſtates*, or Conſervatories of the Seed.

d d. The two Spermatique Veſſels.

e e. The two Teſticles.

f f. The two Epididymes.

g g g. The Guts.

h h. The two Kidneys.

i i. The Tayle of a Female, to which are join'd the parts following.

l l. The Orifice of the *Matrix.*

m m. The two ſmall Baggs.

n n n n. The two bodies of the *Matrix.*

o o. The two Teſticles with their Epididymes, and Spermatique Veſſels.

p p. The Inteſtins.

q q. The two Kidneys.

r r. A great part of the body of a Lizard, of the ſame length and bigneſs, it

was vomited up by a Viper, many dayes after this had been taken.

s s. The rest of the Head, and the rest of the Fore-legs of the same Lizard, cast up at the same time.

t t. The *Oesophagus*, that had contained the said great part of the Lizard.

u u. The Stomach, that had contain'd, and by little and little extracted the juycie substance of the rest of this Animal's body.

The EXPLICATION of what is exhibited in the third Scheme.

A. A whole Sceleton of a Viper.

B. The Head having its Throat cloſed, represented with a part of its Neck.

C. The Head having its Throat in part open, flead on its side, and there presenting the *Salival Glands*, together with their *Lymphatick* vessels, above the great Teeth.

D. The Head without Neck, represented with the Throat open.

E. Another Head without Neck, more open, and distinctly shewing all its internal parts that can be there represented, and which

which may be eaſily underſtood in reading the places, where I ſpeak of them.

F. The whole Skull of a Viper.

G. The inferiour part of this ſeparated Skull.

H. The conglomerate *Salival Glands*, repreſented with their *Lymphatick* veſſels, a little bigger than the natural, to make them the better to be underſtood, and as well as their ſmallneſs permits.

I. The ſame *Salival Glands*; the two Eyes with their Optick Nerves; the five bodies of the Brain, and that of the Spinal Marrow, adhering together, ſever'd from the Crane, and repreſented by the face above.

L. The ſame bodies joined together, repreſented by the face below.

M. Divers great Teeth, ſome by themſelves, ſome in their bag, others accompanied by the Teeth *Exſpectants*, which are ſet beneath them in the ſame bag.

N. The upper Jaw articulated to a ſmall bone, which by its other end is articulated to the root of the great Tooth.

O. The lower Jaw, conſiſting of two bones, and articulated to the lower bone of the Clavicle bent like an Elbow, which de-

pends from the posteriour lateral part of the Skull.

P. The Lungs with the Wind-pipe without the body.

Q. The Heart in its *Pericardium* or inclosing Membrane.

R. The Liver separated in two Lobes by the *Vena Cava.*

S. The bladder of Gall, with the vessel that carrieth its juyce into the Intestins.

T. The *Pancreas* or Sweet-bread, which some take for the Spleen.

V. The Intestins.

EXPERIMENTS

EXPERIMENTS ABOUT VIPERS.

CHAPT. I.

The Biting of a Viper, hapned to a Man.

IN the Month of *June* of the year 1668, I procured a great number of live Vipers, Males and Females, to put the design in execution, I had purposed to my self; Which was, to know in truth all the good and all the evil, a Viper was capable of. I was happy enough in exciting the Curiosity of many intelligent Persons, and amongst others, of some Phy-

Phyſitians of my acquaintance, very knowing and ſagacious, who were pleaſed to take the pains of coming to my houſe every day, to aſſiſt in theſe experiments, and to impart to me their directions.

The firſt Meeting of all proved a ſad one by a ſurpriſing mis-fortune. A certain Forrainer, drawn to ſee our Experiments by his own curioſity, felt in his own perſon, contrary to his expectation, a great part of the grievous accidents, which may be cauſed by Vipers, and furniſht us, ſore againſt our wills, with an Experiment, which was followed with circumſtances too conſiderable to be ſuppreſſed; and I thought my ſelf obliged to recite them firſt of all, becauſe it was not onely the firſt, but the onely, that hath furniſht us with more remarkable things, than all the reſt.

This Gentleman, of 25 years of age, had been by chance the day before at my houſe, when five or ſix douzen of Vipers were brought thither. He would needs ſee them immediately, and I, being deſirous to ſatisfie his Curioſity, drew out of the Veſſel one of the Vipers. He was not contented to ſee her, but took her in his hand,

hand, and kept her there for about a great quarter of an hour, ſuffering her to turn and winde herſelf about his hand and arm, the Viper not ſo much as offering to bite him. Then he tyed her about her neck, and ſo having hanged her, pulled off her skin, and emptied her of her Guts to examine them. I am aſſured, that he would have been ſoundly bitten at that time, if the Viper had been vexed; but not having been ſo, and being pleaſed to breath another air than that of the Veſſel, where ſhe had been long ſhut in, ſhe let herſelf be tyed, after which ſhe could not do that miſchief, which certainly ſhe would have done, if ſhe had not been tyed.

But this proved quite otherwiſe the next day; for this ſtranger being come again to my houſe at the hour of the Aſſembly, he ſaw one of the Vipers upon the Table, which had been held a long while between Pincers, and was much angred. He would take her with his naked hand, though he was earneſtly warn'd to forbear, it being repreſented to him, that he had been too bold already the day before. He had no ſooner taken her in his hand, but ſhe turn'd her head to bite him, and with one of her great

great bent teeth, ſhe laid hold on the lateral inward part of his right thumbe, a little above the ſituation of the nail. The pricking appear'd no more than that of a pin; and it ſeem'd to us not deep, and on the ſurface we only ſaw a very ſmall hole with a very little redneſs; ſo that it was not diſcernable but by its colour. There was not *upon*, nor *about* this litle hole, any ſign of that yellow liquor contain'd in the baggs about the great teeth, and which is wont to be ſhed upon the wound, when a Viper biteth deep; yet the pricking cauſed ſome pain to him at the very firſt, but the finger ſwell'd not of it, no intumeſcence appearing but ſome hours after, as we ſhall relate more amply in the ſequel.

It was found proper to ſcarify the part wounded, and to make ſtrong ligatures above the place bitten, both to ſtop the effects of the Venom, and to diſcharge the wounded part of the ſame; but the Patient oppoſed theſe means, not believing them neceſſary; and he could very hardly be perſwaded to endure any ſcarification; after which, he endured alſo an iron ſpatule very hot and heated over and over again, held very near to the prick't place;

place; which was done, to keep the pores open, and to fetch back and draw out ſome part of the poyſon: Mean while, we made the Patient take two drachms of Theriaque in half a glaſs of Wine.

In leſs then half a quarter of an hour after the pricking, the patient felt ſome debility, and call'd for a chair; he wax'd at the ſame time very pale, and his pulſe was found very low, very quick, and even interrupted. Theſe accidents were followed by convulſive motions, and by a ſtifneſs of his whole body, and chiefly of his neck, and the muſcles of his head: he then alſo complain'd of a very great pain towards his Navil; and there appear'd a coldneſs in his extreme parts, and in the whole face, which was covered with little drops of cold ſweat: his lips alſo were ſwell'd, eſpecially the lower. And finding himſelf urged by the pains about his Navil, and a diſpoſition to go to ſtool, he roſe, and having voided ſome excrements, he vaniſh't away, and at the ſame time vomited not only all the Theriaque he had taken, but all he had eaten at dinner, which was yet un-digeſted. We made haſte to ſuccour him, and found him ſo feeble,

ble, that he was not able to goe up again to the chamber, whence he was come down. And in regard his pulſe continued weak, low, quick, and unequal, and his ſwoundings frequent, as well as his cold ſweats, it was thought ſeaſonable to give him a drachm of Viper-powder in *Theriacal* and *Carduus Benedictus* water, and to apply to him a great Plaiſter of Theriaque upon the Heart and Stomach, but he ſoon rejected what he had taken. One alſo came to give him ſome of the *Orvietan*, mixt with new powder of Vipers, but he vomited up that alſo, and deſired to be put upon a bed, and to have other help adminiſtred to him. During all which time, he neither wanted his ſenſes, nor the uſe of reaſon, notwithſtanding all the feebleneſs of his Body; and he had had great averſion to the *Orvietan*, having no faith at all in it, and not conſenting to take it, but out of reſpect to ſome of thoſe that were preſent, who had preſſed it upon him.

This vomiting not giving time to the remedies to convey and communicate their vertue to the noble parts, it was judged very proper to have recourſe to the Volatile-

tile Salt of Vipers, becauſe that being very volatile and exceeding fit to be quickly conveyed to all the parts, even the moſt remote, the Patient might thence feel the effects with more ſpeed and efficacy, than from all the other groſſer remedies, which having been rejected as ſoon as they were taken, had not had time to be made effectual by the ſtomach, nor to impart their vertue where need required.

We therefore cauſed to be diſſolv'd a drachm of this volatile Salt of Vipers in Theriacal and *Cardaus* water, and gave him about a quart of this mixture; he kept it a little while, and then caſt up a part of it, mingled with ſtore of phlegme very viſcous. We made him take another like quantity of the ſame mixture, which he alſo kept for ſome time, and then vomited up, what might have remain'd of it in his Stomach, and amongſt it much phlegm. We continued to give him ſtill more of the ſame compoſition as faſt as he vomited it up; and there were alſo given him ſeveral Clyſters, to appeaſe the violent and ſtubborn pains, which he felt about his Navil.

His lips remained ſtill ſwolne, his pulſe naught,

naught, and his ſweat cold, as well as his faintings continued very long; but having perſiſted in the uſe of the Volatil Salt of Vipers, his vomiting ceaſed, and he kept the eighth *doſe* in his belly, which was given him about four hours after he received the miſchief: the ſymptoms leſſen'd from that time, the cold began little by little to retire, and gave place to the natural heat, which appeared ſufficiently about five hours after the pricking; his pulſe returned, and was even and ſtrong, but ſomewhat high.

It was about ten of the clock at night, that the moſt troubleſome accidents diſappear'd, the Patient was happy in his unhappineſs, in being ſpeedily and rationally ſuccour'd. I left him not, before his mortal accidents had ceaſed; and then he was carried to his lodgings, whether I accompanied him, and he was put to bed; and by the advice of thoſe perſons, that frequently viſited him during his diſtemper, I made a mixture of one drachm of Confection of *Hyacinthe*, and of as much of the Confection of *Alkermes*, and of one ounce of Syrup of Limons, and of four ounces of *Carduus*-water, which was giv'n him

him at three times, from three hours to three hours. There were given him Citrons to ſmell to, and from time to time ſome ſlices of them ſugred. He took good broths, and drank ptiſan made with *Scorzonera*-roots, and the ſhavings of Hartshorn, mingled with Syrup of Limons, he alſo drank ſometimes a little wine, and there was diſſolved of the Confection of *Alkermes*, ſometimes in his broth, ſometimes in his ptiſane.

This is a thing remarkable enough, that during all the great accidents, his finger was not changed, and there appeared not any ſwelling upon it, but that began, when thoſe accidents ceaſed. In the mean time, the pains about the navil continued, though they were in ſome little degree abated; which obliged the Phyſitians often to preſcribe him Clyſters. His belly was a little ſtiff, but not ſwelled; his tongue was whitiſh, but not dry; his eyes faint and wan; his countenance pale, and his lips ſtill ſwelled.

The ſwelling of the finger extended it ſelf that night over the whole hand; which was often anointed with the Oyl of Scorpions, compoſed by *Matthiolus*, and mixt

with the *Queen* of *Hungarie's* water, but, notwithstanding this anointing, the tumor passʼd onto the arm the next day, with pain and redness, and advanced to the Eye. It was thought fit to apply fomentations made with the roots of *Angelica*, *Imperatoria*, *Carlina*, and *Aristolochia*, and with the tops of *Scordium*, *Centaurium*, *Wormwood*, *St. Johns wort*, *Calamint*, boyled in White wine, and withal to continue the anointing with the said Oyle of Scorpions among these fomentations. Although this was done with great care, yet there appeared no great effect upon it; the Patient was squeamish, and once vomited up even his broth; but this vomiting continued not. He alwayes used the same internal and external remedies, and the same food; but although he found his other limbs in a good condition, and his pulse very equal and moderate, nor had any drought, heat, or pain in the rest of his body, yet was that of the Navil obstinate; and the swelling and the redness of the hand and arm still increased; and from the beginning of the third day, it had seised on the shoulder of the same side, and descended to the armpit, upon the whole breast, and all the neighbouring

bouring parts, and even the whole region of the Liver, notwithſtanding the continual uſe of the fomentations, and the Oyle of Scorpions.

All theſe conſiderations, joyned to the hot ſeaſon, wherein we were, made us apprehend, leſt the gangrene ſhould ſtrike to thoſe parts. It was believed, that, ſince the outward remedies which had been judged moſt expedient, had proved ſucceſsleſs, recourſe muſt be had to internal ones; which induced the Phyſitians to give him, in the evening of the third day, a drachm of the root of *Contra-yerva* in powder, diſſolv'd in cordial waters, with as much confection of *Alkermes*: but we ſaw no abatement of the redneſs, ſwelling, or pain; on the contrary, we obſerv'd, that the ſwelling ſeem'd to ſeize on the left ſide.

After we had well examin'd all things, we found it very neceſſary to return to the uſe of our firſt inward remedy, which had ſtruck the great ſtroke, and had had a manifeſt good operation; I mean, the *Volatil Salt of Vipers*. This was in the morning of the fourth day after the biting. So we gave him half a drachm of that Salt, diſſolved in four ounces of *Carduus* water, and

we order'd that he ſhould be well covered, to make him ſweat. This medicine did work according to our expectation and deſire; for the Patient not onely did ſweat abundantly, but found a very conſiderable amendment in all the ill Symptoms that had remain'd. His pain about the navil was almoſt not ſenſible; the tumor of his Lips, and that, which was in the region of the Liver, Breaſt, and under the Armpits, vaniſh't, and that of the ſhoulder, Arm and Hand was much abated, as well as the redneſs and pain.

We thence judg'd, that we ſhould certainly cure the reſt; and to compaſs it, we gave the next morning to our Patient a like doſe of that Volatil Salt of Vipers, which made him ſweat again very largely; the pain of the Navil ceaſed altogether; the ſwelling of the ſhoulder was wholly gone; and that of the whole arm and hand was yet much more abated, as well as the redneſs and pain. And not to leave the cure imperfect, though the patient found himſelf exceedingly amended, we gave him the next day another ſuch doſe again, and the day following one more, whereby the whole ſwelling, all the redneſs, and all the

pain

pain of the arm, hand, and the finger itſelf, were diſſipated; Mean while there was applyed to the finger a little plaiſter to cicatrize the inciſions, that had been made there, and which were healed three or four dayes after. Which did not hinder the Patient to goe abroad, and to doe his buſineſs, as well as if he had never been bitten by the Viper.

Thoſe that ſhall read this Hiſtory, and examine all the circumſtances of it, the ſeveral and ſurpriſing accidents of the biting of the Viper, which we ſaw, and the effectual operation of the remedies, employed to remove them, will therein find ample matter to exerciſe their reaſoning upon, and will ſoon judge, that we had cauſe, accurately to inquire, as we have done, into all the parts of a Viper, *to* know them well, and what they can doe; *to* make a great number of Experiments upon all its parts, and *to* apply ourſelves to the preparation of the excellent remedies, that may be drawn from the body of this Animal.

The Extraordinary effect of its Volatil Salt, in ſtopping and in overcoming, firſt of all the Venome, which ſo violently ex-

ercised its tyranny over the natural heat, and all the noble parts, and which doubtless would have altogether triumphed over them: the activity, penetration, and force of the same Salt, going to find out the poyson, and expelling it from the remotest parts of the body, where it had fortified itself, and whence it endeavoured to regain the place it had lost, and where, in the mean time, it seem'd to despise the ordinary most powerful remedies. All this, I say, is sufficient to make it to be wondred at; and men will, doubtless, averr, that the ill, which Vipers are able to cause, and which every one may easily avoide, is nothing in comparison of such a remedy, as the same Vipers can furnish, and which may serve, not onely to heal their bitings, but also to overcome many other obstinate diseases, against which the ordinary remedies perform nothing; not to speak of many other good preparations, made of Vipers, which we intend to describe hereafter.

EXPE-

EXPERIMENTS
Of the Biting of Vipers, upon other Animals.

CHAPT. II.

Experiments upon Dogs.

THE effects, that are ſurpriſing, are wont ſenſibly to touch the Minds of Men; and they are they, which excite the Curious to inquire into the Cauſe of them; and although *this* do alwayes precede *thoſe*, yet it would not be known, and we ſhould not ſo much as be aware that it was, if the effects thereof did not firſt appear. Being therefore to treat of the Biting of Vipers, we hope, it will not be thought amiſs, if we begin with the recitation of the Experiments, by the Examples of its effects. And not

to be tedious to the Reader; having reviewed all that hath been experimented at my houſe, both the laſt and this year, I ſhall confine my ſelf to what I think deſerves moſt to be communicated, what ſerveth moſt to our purpoſe, and what may give moſt ſatisfaction to the Curious.

One of the moſt conſiderable Experiments was made on a *Dog*, which was bitten by an angred Viper at the upper lipp. The dog was not much moved at it at firſt, but little by little grew ſad, and his jaw began to ſwell: a little while after he vomited up the laſt food he had taken, and dunged. Then ſome bread, fleſh, and water being offred him, he would touch none of it, he remain'd in a proſtrate poſture without complaining, the place of the pricking waxed livid, and this lividneſs extended it ſelf to the neck, and as far as the breaſt, as did alſo the ſwelling. At length he dyed, but not till fourty hours were paſt after the biting. His belly appear'd not ſwoln, and without we obſerv'd nothing extraordinary but the tumour and lividneſs in the part prick't, and thereabout. The Dog being opened after his death, we found in the tronc of the

the *vena cava* a little bloud curdled, and we noted, that the reſt of the bloud, in this place, in the heart, and every where elſe, was of a dark colour, and of a very ill conſiſtence, as if it were blood in part diſſolv'd and corrupted. The Stomach appear'd of a darkiſh colour, but the Meſentery and the Gutts were darker. We found no alteration in the Heart, Liver, Lungs, nor the Spleen; all theſe parts being of a very fine colour, and in their natural condition.

The Biting of a Dog at the Ear.

THis Dog howled from the time he felt the biting, and continued his howling for half an hour; then he ceaſed to howl and to complain. The place prick't wax'd livid, and ſwell'd, as alſo did the Neighbouring parts. This dog vomited not, but voided ſome excrements, which ſeemed natural. He would neither eat nor drink, no more then the firſt, and he ſoon dyed, having liv'd no longer then twenty four hours after he had

had been bitten. We saw outwardly nothing un-common, but the lividness and swelling at the neigbouring part, and thereabout. But having opened him, we found all the inward parts in the same condition with those of the former dog. 'Tis true, we did not finde in this dog any coagulated blood, neither in the heart, nor the *vena cava*, nor else where, but it was of an obscure colour, and of an odd consistence, and in a visible dispoſition to coagulate.

Another biting of a Dog.

WE had a Dog bitten by an irritated Viper at the tip of his Nose, the dog howled, when he felt himself bitten, but was soon appeased, falling to lick the place prick't, and to scratch it with his paws. He lay not down, but continued for some time in that exercise, and went up and down in the chamber. The place bitten became somewhat black and blew, but swell'd not; and a little while after the dog drank and eat, as if he had never been

been bitten: The lividneſs diſappeared little by little, and the Dog was as well as ever.

The Biting of a little dog.

A Yong Puppy, but 7. or 8. dayes old, was bitten in the leg by an enraged Viper; the dog began to howl as ſoon as he was bitten, and ſo continued till he dyed, which he did one hour after. The part pricked was ſwelled and livid, as in the former, and the animal being open'd, we found nothing extraordinary in his body, ſave onely ſome lividneſs in the Stomach and Gutts, and ſome blackiſhneſs and ill conſiſtence in the bloud, as in the others; for all the other inward parts appear'd to us very ſound.

Another biting of a Dog.

WE cauſed alſo another Dog to be bitten under the Belly by another an-

angred Viper. He howled presently, but that lasted not long. The place bitten swelled much, and was very livid, and the tumor and lividness reached over all the natural parts. This Dog drank often, but would eat nothing, and was alwayes in this condition without growing worse. Two dayes after, to be more certain of the thing, we caused him to be bitten again, and that twice, near the same place, where he had been bitten at first. He again howled much, and the swelling increas'd, and extended it self over the whole belly, as well as the black and blew colour; but it went no further; for the dog often licked his wounds, and drank store of water, and at last fell to eat, so that without any other remedy, but his tongue, all the swelling and blew colour vanish't in five or six daies. And the dog was in the same condition, he had been in before he was wounded.

Another Dog bitten in the Tongue.

THis Dog gave us some trouble; for he defended himself a great while, be-

before he would let out his Tongue; but yet at last he received therein a deep bite by an enraged Viper. At first he howled extremely, so as to be heard afar off, and so continued, tossing and tormenting himself for half an hour together, and then dyed. We opened him also, and although the Heart, Liver, Lungs, and Spleen were in a very good condition, his tongue was exceedingly livid; his mesentery cover'd all over with black spots, some of which were blacker then lentils, under which there was coagulated blood; the Stomach and Guts were also blacker than those of all the others. The bloud very black, and beginning to coagulate in the heart, and in the *vena cava*, being also of the consistence of bloud curdled and corrupted.

This last Experiment gave us great satisfaction, informing us fully of the effects of the venomous biting of a Viper, and shewing us, that the poyson goes not directly to the noble parts, seeing we never observ'd any alteration therein, but that 'tis chiefly the bloud it works upon, since it corrupts the substance thereof, coagulateth it, or separateth its parts, disturbs

its

its circulation; and at the ſame time hinders the communication of the Spirits through the whole body, depriving the noble parts of them, as well as of the pure bloud, which was wont to bedew them, and deſtroying them indirectly, by cauſing this privation of Spirits and of the good liquor, whence depends their ſubſiſtence.

We alſo found thereby that the progreſs of the venom of a Vipers biting principally depends from the place bitten, and from the bigneſs of the veins or arteries, which the teeth hath lighted on. For, the tongue of the Dog being full of veins and arteries, 'tis no wonder, if the Venom, meeting with them, and finding in them a large way, very ſhort and very free to triumph over the bitten animal, did ſoon produce its effects, and cauſed death much more ſpeedily, than that, which met only with ſmall, ſlender and winding branches, by which its way was ſtraighter, more about, and longer; though it failed not to do execution at laſt; which it would have done ſooner, if the paſſage had been freer.

We may judge by the effects of the venom

nom of the Vipers biting in those dogs, and especially in the last, that the vomiting, and the extreme pains about the Navil, which befell the Gentleman, above discoursed of, proceeded partly from the bloud which was coagulated or disposed to coagulation in its course, and which could not freely circulate; and partly from this, that the spirits, which accompany the bloud in the circulation, finding obstacles in their passage, endeavoured to make way for themselves, and to that end, doing violence to the lateral parts in their way, caused in those places the extreme pains, which the Patient felt there; which might also be augmented by the bloud, that probably was coagulated out of the great vessels, and might be dispersed in the form of spots in the Mesentery, or elsewhere, just as in the body of the Dog.

We may conclude also, that the cold sweats, the convulsions and the faintings, wherewith the Patient was molested, came from nothing else, but the defect of the ordinary commerce of the spirits with the noble parts, and ~~want of the~~ goodness and purity of the bloud destinated to bedew them.

Con-

Concerning the ſucceſs of the remedies employed to cure the ſaid Gentleman, we ſhall declare our thoughts thereof in the ſequele of our Experiments, after we ſhall have given proofs ſufficient to ſupport them.

As to the Dogs, that were cured by licking the wound, I think that that was a good means to recall and draw back the venom; and I am much of their opinion, who believe, that if the perſon bitten, or ſome friend for him, ſhould for a good while and ſtrongly ſuck the wound, it would be cur'd, provided that the teeth of the Viper have not lighted upon ſome great veſſel, whereby the progreſs of the venom may prevail over the force of ſucking. I am alſo perſuaded, that theſe ſucked and recall'd Spirits are incapable to annoy him who ſucks them, partly becauſe they have been weakn'd by the action they have been upon, partly becauſe they are then deſtitute of the inſtruments proper to convey and ſecond their action, to wit, the teeth of the Viper.

CHAP.

CHAPT. III.

EXPERIMENTS

Of the Biting of Vipers, made upon Pigeons and Pullets.

THE Experiments made upon *theſe* Animals have likewiſe been very uſeful to us, to know the effects of the Biting of Vipers, which have been very like in both.

We cauſed a *Pigeon* and a *Pullet* to be bitten by a vexed Viper, almoſt at the ſame time, in the moſt fleſhy part, namely in that under the breaſt. We ſoon after obſerved in both a very thick and extraordinary beating of the heart, which went on ſtill increaſing, and in ſuch a manner, that both Pigeon and Pullet were dead in leſs then half an hour. We ſoon opened them, and found in both of them a little bloud coagulated in the heart and the *vena cava*, and all the reſt of the bloud blackiſh, diſpoſed to curdle, and as 'twere turn'd and

corrupt; but the Heart, and Liver, and all the inward and outward parts of a very good colour, and in a very good condition, ſave that a little lividneſs appear'd upon the place bitten.

We have frequently obſerv'd the ſame thing in many Pullets and Pigeons: But it will not be amiſs, here to relate the different ſucceſs in two Pigeons, we cauſed to be bitten equally and in the ſame place by an angred Viper. One of them we made to ſwallow the weight of about half a crown of Theriack, a moment before it was bitten, giving nothing to the other. The former being bitten, went to and fro in the room, ſo as not to ſhew any ſign of illneſs, but the latter was dead in leſs than a quarter of an hour We afterwards cauſed the former to be bitten again in the leg; and then it grew ſick by little and little, and dyed half an hour after. We found the place of the firſt pricking much more livid, then that of the Pigeon, which dyed in a quarter of an hour; and even more then the place of the leg, which was bitten afterward. We judged, that the vexed ſpirits unable to penetrate into the body, defended by the Theriaque, had wrought

wrought upon the outward part, and round about the place bitten, where they had coagulated the bloud, and caused the lividness; whereas the like spirits, having met with no resistance in the other Pigeon, had gained and wrought upon the inner parts, having left and as 'twere despised the place, at which they were entred. We also wondred not, that the Theriaque, which had vigorously repulsed the Spirits introduc'd by the first bite, could not resist the latter but for half an hour, and that at last it was forced to yield, in regard that the number of the enemies was great, and being weakn'd by the conflict, it had but now endured, had not force enough to bear up against the new assault of the latter.

We did also prick several times, and pretty deep, dogs, pigeons and pullets, with the long teeth of Vipers, some pull'd out of the throat of dead ones, others out of such as were alive. There was also one of the company, who handling a dead vipers head, had a mind to prick his finger, and actually did so, with one of the great teeth, so that the bloud issued. I also my self thrust into my hand one of them, and so deep, that a piece of it remain'd more

than half an hour in my fleſh; but in all this we found not the leaſt appearance of venom, nor any ill, but ſuch, as might be cauſed by the pricking of a Pin, or ſome ſuch thing.

We alſo deplum'd a Pigeon at the moſt fleſhy place, and holding with both our hands the jawes of a Viper open, and making her raiſe her great teeth, we preſſed both the jawes at once againſt that fleſhy part, and cauſed the teeth deeply to enter into it, and order'd the matter ſo, that the yellow liquor of the Gums had time enough to paſs into the wounds, which the teeth had made. We at the ſame time ſaw, that the bloud iſſued out of the wounds, and mingled it ſelf with the yellow juyce, which remained there. We had then ready a little ſtone, come from *Portugal*, which thoſe of that Country call the *Snake-Stone*, being pretty black, ſhining, roundiſh, and flat, about the bigneſs of a French piece of five *Sols*, but three times thicker; which we preſently applyed to the place bitten, which was cover'd with bloud, and with the yellow liquor mingled therewith. The ſtone immediately was faſtned to the wound, and we perceived nothing extra-

extraordinary in the Pigeon. We might have believed, that this ſafety of the Pigeon was due to the vertue of this Stone, which they would aſſure us was infallible againſt the bitings of Vipers and all kinds of Serpents, if we had not ſome dayes before tryed the like Stone upon a Pigeon, bitten in the ſame place by an angry Viper, and if that wound had not been follow'd by the death of that Pigeon, a quarter of an hour after. We thought, this very well deſerved another experiment; and having ſtill the ſame Stone by us, which ſeem'd to have ſaved the former pigeon, and ſuch another, which the Lord Ambaſſadour of *Spain* had truſted his Phyſitian with, we by one and the ſame enraged Viper cauſed to be bitten two Pigeons of equal bigneſs and fleſhineſs, each in the ſame place, well freed from its feathers. The bloud was ſeen upon both wounds; but there appear'd but little of the yellow liquor. We ſoon applyed both the Stones, one to each Pigeon; they preſently ſtuck faſt to the places pricked; but we ſaw immediately in both a very high and thick beating of the heart, which was follow'd by the death of both Pigeons, which hap-

ned at one and the ſame time, in leſs than a quarter of an hour.

We had alſo a mind to know, whether the Venom, that had ſo much force upon the bloud, were alſo able to make ſome ill impreſſion upon the noble or ſolid parts of the bitten animals, which parts appear'd to us very fair and very well conditioned. We gave alſo a Pigeon, dead of a Vipers biting, to be eaten by a Cat that was very lean, which fed very greedily upon it; and the ſame did afterwards eat many more, and Pullets alſo; upon which ſhe grew very fat, ſo far was ſhe from finding any inconvenience thereby.

Moreover we had a deſire to learn, whether one and the ſame Viper was able to kill by its biting divers animals wounded, one preſently after another; and whether the Venom was exhauſtible, ſo that the animals, bitten laſt, might be free from its miſchievouſneſs. To know the truth hereof, we cauſed to be bitten five Pigeons one after another, by the ſame Viper, which we angred every time ſhe was to bite: All theſe Pigeons ſoon dyed; and we particularly obſerved, that the laſt bitten dyed firſt of all. And as to the Bloud,

and

and all the inward and outward parts, they were in a manner alike with those of the Pigeon, that was bitten first.

The various Experiments, we have been relating, do insensibly oblige us to deliver our thoughts concerning the Venom of Vipers, and its operation. We think this to be a proper place to declare ourselves here, and afterwards to employ the rest of our main experiments for the defence of what we shall have advanced upon this Subject.

CHAP. IV.

Of the Venom of a Vipers Biting, and its Operation.

THE Antiens, prevented by the opinion, that there were very few parts in a Viper, that were exempt of poyson, have but very slightly examin'd them. And as they esteemed that the Choller of the Viper did much con-

tribute to the Venom, believing, that the ſeat thereof was in the Gall, they there alſo ſetled that of the poyſon, and imagined, that the taſte of the Gall, very ſharp and very bitter, was an argument of its malignity, and that the veins and arteries, which paſs near the Gall, and may be followed as far as into the jawes, and appear the ſame through the whole body, above and below the Gall, were the pipes, which Nature had purpoſely form'd to carry the juyce of the Gall into the Gums, and that it was that liquor, which cauſed all the mortal Symptoms, and death it ſelf.

But they have not conſidered, *that* this Choler of the Viper reſideth not in the Gall; *that* the Galls of innumerable other Animals have a taſte very approaching to that of a Viper, and yet are not venomous; *that* the veins and arteries, which paſs near the Gall, and ſeem to part thence and extend unto the Gumms, and all the parts of the Body, are veſſels deſigned, onely to convey the blood, which have not their origin in the Gall, and which cannot carry a juyce, which they could not receive: *that* there is not any

taſte

taſte of Gall in all thoſe imagined Veſſels, no more than there is in the liquor of the Gums, nor in all the reſt of the Body above the Gall: and *that* in the whole Bladder of Gall there is but one veſſel, that is any thing conſiderable, though it be very ſlender, which iſſuing, as we have ſaid, from the internal ſide of the upper part of the Gall, deſcends (ſo far is it from aſcending) and diſcharges it ſelf into the firſt inteſtine, according to the deſcription we have made of it, and conformably to the Figure, that may be ſeen in the *Cut*.

But not to ſtay upon principles ſo ſlightly eſtabliſh't, and ill maintain'd, foraſmuch as we have on our ſide a great number of Experiments, upon which we are grounded; We ſay, That the *Gall* of a Viper is not at all Venomous, but *that* on the contrary it contains a Vertue, that is Balſamick and cleanſing, and very proper for many good uſes; *that* there is no Veſſel, which carries its juyce to the Veſicles, that are about the great teeth; *that* the yellow liquor, therein contain'd, is in all things very different from that of the Gall, excepting that they are both equally free from Venom; *that* that yellow liquor is gather'd,

ther'd, and form'd by the *Salival Glands*, above deſcribed; *that* it is carried into thoſe Veſicles or Baggs by the *Lymphatick* veſſels which part from thoſe Glands; *that* this juyce is nothing but a pure and plain *Saliva*, of which we have already obſerv'd the uſe; and *that* this juyce contributes nothing to the venomouſneſs of the Biting; ſince, being taſted and ſwallowed (as we have often experimented) it does no hurt neither to man nor beaſt; and ſince alſo, being put upon open wounds, and upon inciſions made in the fleſh, the ſame being rubb'd therewith, and mingled with the blond, it annoyes nothing at all: notwithſtanding the judgment of a perſon very intelligent, and particularly in this ſubject of Vipers, wo aſſures to have made a great number of Experiments; which being contrary to ours, the great opinion we have of the abilities and the ſincerity of that famous man, hath obliged us to employ the more care and exactneſs, and to confirm ourſelves, by a very great number of Experiments, which have alwayes been found alike, in the truth, we here aſſert, and of which we ſhall make evident and irrefragable proof.

We

We ſay further, that there is no other venom in all the other parts of the Body; and more, that there is none even in the great teeth, if the Viper be not alive, and the biting not accompanied with vexed and *enraged Spirits*. The hurt, which the teeth doth, when the Viper biteth, conſiſts chiefly in that it opens a door to the angred Spirits, without which irritation the Biting of the teeth is not mortal, and ought to be no further conſider'd then for the deep and direct wound, which a tooth, ſo ſharp, ſo long, and ſo ſlender, of any other animal whatſoever, might make. In which circumſtances, the great number of Experiments, by us made, hath rendred us knowing; in regard that we have obſerved a quite manifeſt difference in the Biting of a Viper angred, from that of a Viper, which was made to bite by holding its jaws, and by preſſing its great teeth into the body of ſome animal: becauſe this forc'd action ſerves rather to make the Viper retain its ſpirits, then to let them out; for which the freedom of the animal is neceſſary, the ſpirits not being able to part, but the imagination and the Choler of the Viper

muſt

muſt immediately precede and thruſt them out. For this way of biting, by holding the jaws, and thruſting the teeth into ſome animal, although it emit more of the yellow liquor upon the part bitten, than the biting made by an angred Viper, left to it ſelf, is not followed by any ſiniſter accident, and is healed like a ſimple wound, whereas the other is attended with death, in caſe we want means of preventing it.

The effect therefore of the venom being altogether of a ſpirituous nature, and not working but according as the ſpirits are more or leſs iritated and puſh't on, and according as they finde more or leſs free paſſage, we have reaſon to impute it to the exaſperated Spirits, having found no footſtep of it, neither real, nor apparent in all the viſible parts. But the better to maintain this our aſſertion, we ſhall here give you our thoughts concerning the action of the enraged Spirits.

Theſe Spirits then, puſh't on by the choler, which the Viper had conceived, finding the apertures, made by the Teeth, follow their inclination, and as it is their property, to advance and penetrate, they at the firſt ſeek out all wayes for it, and they

they advance more or leſs, according to the facility or difficulty, they meet with. Thence it is, that the Biting is much more dangerous, when the teeth light upon the greater veſſels, than when they only light upon Fleſh, or the little branches of the veins and Arteries. So that the vexed Spirits of a Viper, meeting with the bloud and Spirits contain'd in the veſſels of the bitten animal, puſh and preſs them to make way for themſelves, and embaraſſing the particles that compoſe the bloud, cauſe there a coagulation or confuſion, which diſturbs the ordinary Circulation, and by this means hinders the communication of the Spirits, to the principal parts, from which depends their ſubſiſtence and life. And by reaſon of this privation they muſt ſuccumbe, either for having been attack't in their fort by theſe vexed Spirits and infected by them, or rather becauſe theſe ſpirits of the Viper have made themſelves maſters of the *avennes*, and obſtructed the paſſages, by which the blood and the ſpirits were communicated to them.

We conclude therefore, that the imagination of the Viper being irritated by the

the *idea* of revenge which she had fram'd to her self, gives a certain motion to the Spirits which cannot be expressed, and pushes them violently, through the nerves and their fibres, towards the cavity of the teeth, as into a funnel; and that from htence they are convey'd into the blood of the animal, by the opening, which they have made, there to produce all those effects, of which we end eavour to give a reason. Others, more able than we, may perhaps carry their reasoning farther.

For the rest, some have thought, that those enraged Spirits have in them a secret acidity, capable to coagulate the bloud, and to hinder the Circulation, whence the mortall accidents proceed. But since that this acidity may have been produced in the mass of the Blood by its own parts, which come to be dissolved and severed, when they are tainted by the venom, and since corruption slides into it, as into milk, which sowreth and corrupteth of it self, without mixing any acid thing therewith; it is not necessary to search for a coagulating Acid in the Spirits of the Viper, which cannot be perceived by the taste to know the truth of its existence therein; and

and that the leſs, becauſe *that* Acid may be naturally formed in the Bloud of the animal bitten, without looking for it in the Viper, as if it had come from thence.

How-ever this be, we muſt agree herein, that this irritation in the phanſy or in the ſpirits of the Viper is the main cauſe of the activity and piercingneſs of its venom, and that without it the biting would not produce ſuch ſurpriſing effects, as thoſe are, of which we have related ſo many Examples. Nor is a viper the onely animal, whoſe biting is mortal: Dogs, Wolves, and Men themſelves prove that; and not to go from our Subject, the biting of Serpents, of which the Viper is a *ſpecies*, is more or leſs malign, according to the nature of their ſpirits, and eſpecially according as they are angred and exaſperated.

It ſeems, that *Cleopatra* was well inſtructed in this matter, when ſhe, intending to kill herſelf, commanded to be brought her two *Aſpes* in a fruit-basket, and pricked them with a golden needle, which ſhe pulled out of her hair-dreſs, and made her ſelf be bitten immediately by one of thoſe Aſpes in the right arm, and by the other,

in

in her left breaſt; knowing (as a famous Author ſaith) that their natural fierceneſs and cruelty was not ſufficient to execute well what ſhe deſired, and that it was needful, this pricking ſhould ſerve to provoke the ſpirits to bite to purpoſe, and to render the wound mortal; if at leaſt it be with *their* biting, as it is with that of our Vipers, who alſo have this particular quality, that not onely they are ſoon angred, but that in the very moment of the irritation they bite with a ſtrange ſwiftneſs; which ſpeaketh much the ſubtlety and impetuouſneſs of their ſpirits, whence depends their ſtrength and activity. We obſerve alſo, that in diſtilling Vipers bodies, we thence draw very ſubtile and very penetrating parts, and in much greater quantity, in proportion, than from any other animal.

In the mean time, the obſtacle, which theſe irritated ſpirits of the Viper give to the communication of the ſpirits of the animal bitten, nor the coagulation, or confuſion, which they cauſe to the bloud, are not of that force, that ſpecifique remedies ſhould not maſter them, and reſtore the animal unto that Condition, where-

wherein it was before it was wounded. Which is that, we ſhall prove in the ſequele by divers Experiments; where we hope to ſhew in what manner the remedies do overcome the powerful action of thoſe enraged Spirits.

CHAP. V.

EXPERIMENTS

Of the yellow juyce, contain'd in the Veſicles of the great teeth, made upon divers Animals.

IN the deſign, we had, well to try all things, we purſued our Experiments, and to be well aſſured of the quality of that yellow liquor, which hath been believed ſo dangerous, we cauſed to be bitten, by ſix angred Vipers, ſe-

parately and ſeveral times by each of them, a ſlice of bread, and ſo much, that it had well exhauſted and retain'd all the yellow liquor, contained in the Gums of theſe ſix Vipers: At the ſame time we gave this ſlice of bread to a faſting Dog, to eat, who was no more inconvenienced thereby, than if he had eaten a piece of dry bread, that had imbibed nothing of this juyce.

We have alſo often made divers Pullets and Pigeons to ſwallow pieces of bread dipped in the ſame liquor; and we can aſſure, that none of theſe animals had any miſchief thereupon.

I my ſelf had the curioſity to taſte of this juyce, which I have divers times done in the preſence of many perſons, without waſhing my mouth before or after. And ſeveral Phyſitians alſo have taſted of it themſelves, both to know the taſt, and to be aſſur'd of the harmleſsneſs thereof; and 'tis certain, that they were no more incommoded thereby than my ſelf.

And becauſe it hath been believed, that this juyce, being thus taſted and ſwallowed by Men or other Animals, that had no wound

wound nor Ulcer in their mouths, nor in their ſtomachs, was indeed harmleſs; but that it was quite another thing, when it did accompany a Biting, and entred into the openings made by the teeth and that the ſame being put upon an Ulcer, a wound, or a ſimple excoriation made on the skin, was mortal, and failed not to produce its effect, three or four hours after it had been put upon the wound; and that as well upon Men, as all other ſorts of Animals, without exception; we reſolved alſo to make many Experiments upon this account.

I can therefore ſay, in the firſt place, that I have taſted of it my ſelf, at ſuch times, when my mouth was excoriated, upon which I obſerved, that even my ſpittle was a little ting'd with bloud, without having perceived any acrimony, or extraordinary heat. We alſo made a Tryal upon a Pigeon, which we wounded under the wing, and in the leg in the ſame moment of time; and we let into each wound ſome of this yellow liquor, which we juſt afore had drawn from the gums of two enraged Vipers; then we re-joyned the skin, well to incloſe the ſaid liquor, and we bound both wounds over with a

band, that nothing might run out. We can assure, that the Pigeon felt not any inconveniency from it, and that we even found upon the wound, made on the leg, a coagulated drop of the juyce, round, and of the same colour, as we had put it there, and the bloud of the place dryed, and that, soon after, both wounds were dryed up, and heal'd of themselves.

We also made the like Experiment upon a Cat, which we purposely wounded in the leg, but he received no harm at all by it. We have also often experimented it upon Pul'ets, and other Pigeons, but alwayes with the like succes, and without any offence to the Animals.

The same tryal hath been thrice made at three several times, and even twice in one day, upon a dog, whom we had wounded on purpose towards the bottom of the Ear, where he could not lick his wound; and no mischief at all followed upon it.

We cannot but adde here an Experiment of the mortal effect of the enraged Spirits, without any intervention of the yellow liquor. We made a Viper several times to bite upon a slice of bread, by pressing every time its jaws against the bread,

and

and we did this ſo often, that not only that juyce was altogether exhauſted, but that the bloud began to come out of the gums. At the ſame time we vexed the Viper, and made it bite a Pigeon in the moſt fleſhy part; and we obſerv'd, that indeed the effects of the venom of the biting were not ſo quick, the Pigeon not dying but an hour and an half after it had been bitten; but then we found alſo, that the teeth of the Viper were in a manner cover'd with the crums of the bread, from the force of its having bitten at it, and that that had hindred them from making a deep entrance, and that having half ſtop'd up the pores of the tooth, a good part of the angred Spirits could not come forth; ſo that the death of the Pigeon could not follow ſo faſt, though yet it hapned without any mixture of the juyce which had been altogether emptied.

CHAPT. VI.

EXPERIMENTS

Of the Gall, Eggs, Inteſtins, Head, and Bloud of Vipers, made upon divers Animals.

WE have made ſeveral Dogs and Cats to ſwallow the Galls of Vipers, ſometimes whole, ſometimes burſt, and diſſolv'd in ſome liquor, and ſometimes ſix, ſometimes ten, ſometimes a dozen at a time; but they never found themſeves ill after it, no more than the Pigeons and Pullets that had ſwallowed ſome of it, and which we had alſo wounded, and afterwards rubbed with the Gall of a Viper: for this Gall ſerved them for a Balſom, the wounds being the ſooner cured thereby; ſo that we can juſtly declare the gall

gall to be free from all venom, as well as the yellow liquor; and even inculcate here what we have already ſaid, that the galls of Vipers have particular vertues in them.

We can ſay the ſame of the *Matrix* and Eggs of a Viper, and of all the Inteſtins, of which we often have made good quantities to be ſwallowed by Doggs and Cats, ſome of which have eaten thereof with greedineſs, when they could light upon't; and none ever hath felt any trouble after it. On the contrary, we have tryed, that having cauſed to be bitten, at the thickeſt place of the Ear, by a ſufficiently vexed Viper, a young Cat, very lean, that had but juſt before eaten the Eggs, the *Matrix*, and all the guts of a Viper; the biting had almoſt no effect, and there appeared nothing but a very little ſwelling, and a very inconſiderable lividneſs in the place bitten.

We have further made many Dogs and Pigeons ſwallow the Heads of Vipers, newly cut off, and yet living, having only cut with Sizers the point of their great teeth, leaſt in paſſing down they ſhould bite the throat, or the inward parts of the animals, that were to devour them; but

we have not obſerv'd any thing after it, that was extraordinary, in all thoſe creatures.

We had alſo a deſire to find, Whether a Viper, being eaten by an Animal, which it had bitten before, would be cur'd of that biting. We therefore cauſed to be ſlightly broyled the head of a Viper, which had on it a part of its neck, newly ſever'd from the body; and we made a Dog to be thrice bitten at the Ear by a well enraged Viper, in ſuch a manner that the bloud came out at the three places pricked. We ſoon caſt before him the head and neck, broyled, and yet hot. The dog, that was hungry, and felt not ſo ſoon the effects of the bitings, immediately ſeized on the head, bruiſed it between his teeth, and ſwallowed it down: after which we ſtayed a pretty while to ſee, whether the three bitings would prevail over the devoured head and neck; but the Dog was free, except ſome blewneſs and a little tumor, he had at the places bitten, but which little by little vaniſh't in three or four dayes.

We made alſo a dog to be bitten three times in the ſame place, and without broyling the head of the ſame Viper that had bit

bit him, we caſt it to him, hoping that he would eat it, becauſe he had not eaten any thing for many hours before; but the dog would not touch it. Upon that we bruiſed and ſtamp'd that head in a mortar, and ſo cramm'd it down the dogs throat; rubbing alſo the bitten places with the bloud of the ſame Viper: which done, we expected the ſucceſs; which was, that this head, raw and bruiſed, and if you will, aſſiſted by the blood of the Viper, being applyed to the part bitten, had produced the ſame effects with the former, which had been ſo ſlightly b·oyl'd; in regard that this dog was free, excepting thoſe inconveniences the former ſuffer'd, and was, after that as ſound, as if he had never been bitten.

If theſe two Experiments had been made, before that Gentleman, above diſcours'd of, was bitten by the Viper, we ſhould have been in much leſs anxiety for his preſervation. But it was enough, that we were able to ſecure him from the dangerous effects of the biting, by wayes grounded upon rea'on, and by remedies, that were more proper for ſuch perſons, as could not well reſolve to eat the bare fleſh of Vipers.

CHAP.

CHAPT. VII.

Several other Curious Experiments made upon Vipers.

WHereas we gave but little credit to what divers Authors have assured to be true, namely, that the Head of a Viper bruised and applyed to the biting of it would heal the same; we made a Pigeon to be bitten in the most fleshy part of its body, well freed of its feathers, and we cut, bruised, and applyed to the place bitten, the head of the same Viper, that had wounded the Pigeon, and took care to have it held upon it with a hand. We also cut the head of a living Viper, and had it slightly broyl'd, then bruis'd and laid hot to the wound of another Pigeon, which had been newly bitten in the same place, to find, whether by the heat of the broy-

broyling, the parts of the head being more open'd, and the ſpirits more ſet at liberty, they would work better; but the ſucceſs was not more beneficial for one Pigeon, than the other; for they both dyed half a quarter of an hour after they had been bitten; and their bodies being open'd, we found in them, what we did in others, kill'd by Vipers, namely a blackiſh blood, in part coagulated, and half corrupted, in the heart and the great veſſels; but we took notice, that there was leſs black & blew about the place bitten; which was perhaps all the effect, that theſe bruiſed heads had produced, which had not been able to carry their virtue any farther.

It is not ſo, (to ſay that on the by) with the pricking of a *Scorpion*, which being bruiſed on the part ſtung, ſerves for an Antidote, and cureth: for which this reaſon may be alledged, that the venom of a Scorpion, not working ſo briskly, and not piercing with ſo much quickneſs unto the inward parts; the Spirits, that iſſue from the bruiſed Scorpion, have leiſure to make way for themſelves, and to go and find out the venom, to joyn with it, and to make it come forth; whereas the venom

nom of the Viper goes immediately to taint the mass of the blood, and the parts which it bedeweth; as was apparent in our Gentleman, who had no pains nor swelling in his arm, but after all the other accidents; contrary to the operation of the Scorpions Venom, which, before it passeth further, acteth upon the part prick'd by benumming, cold, and tension, or by inflammation, and very great pains; as those Authors, that have written thereof, and the persons, that have been prick'd by them, doe assure.

We have found very true, what Signor *Redi* hath said of the effects of the Essence of *Tobacco* upon Vipers; That, running their skin through with a thred dipp'd in that essence, and leaving the thred in the skin, the Viper dies in less than a quarter of an hour, and becomes as hard as brass, but soon after supple and plyant. We have also tryed, that a little piece of Tobacco in the roll, held in the throat of a Viper, and the smoak of Tobacco blown into its throat produce the like effect, but a little more slowly; and that both do cause convulsions, and extraordinary contractions in a viper, which are attend-

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ed with death; and that, when all the other parts of the body are deprived of motion, the heart yet beats about half an hour after; and that Tobacco, or its eſſence, kills Snakes as well as Vipers. I know not, whether this will do with other animals, ſince, having run a thred dipt in the eſſence of Tobacco, into the skin of the under-belly of a Dog, he immediately howled very much, and continued ſo to do for half a quarter of an hour, running round, then lying down, and then riſing again, and in the mean time purging above and below, and voyding excrements more liquid then ordinarily. He would eat nothing, and onely drunk now and then a little, after which he vomited; but this was all the trouble he had, which inſenſibly went away, and ſoon after, without any other accident.

We have vexed a viper, and made it to bite another viper, which on purpoſe we held within the reach of its teeth. But although ſhe open'd her throat, and put her ſelf into a poſture of biting, yet ſhe refrained, and ſunk not her teeth deep into the body of the other; which moved us to thruſt them our ſelves by preſſing her jaws; but

but the bitten viper received no inconvenience from it. Yet we have obſerved, that a viper which was made to ſwallow ſome of the eſſence of Tobacco, and which we yet held by the neck with pincers, did bite herſelf; but as the eſſence alone failed not to kill her, ſo there was no reaſon to impute her death to this kind of biting, which was probably an effect of the convulſive motions cauſed by the eſſence of Tobacco.

We alſo pierced twice, in the day-light, with the point of a pen-knife, the head of a live viper in the midſt of the Brain, from the top to the botom; one thruſt long-wayes, the other croſs-wayes, and in ſuch a manner, that the blood run out both above and below; but notwithſtanding, the viper, being let looſe, crept about as before, and as if ſhe had not been wounded; but ſhe ſtill loſt bloud by the wounds, and at laſt dyed at the end of an hour, but her heart did ſtill beat and continue to do ſo two hours after. Which Experiment ſufficienly argues the extraordinary vivacity of the Spirits of the viper.

We have alſo put into a glaſs-veſſel, a living

living viper, together with three live *Scorpions*, and there left them together four dayes; but found them in the ſame condition, in which they were, when we put them in, though there be Authors that aſſure, that theſe Animals kill one another, being ſhut up together in one and the ſame veſſel. Mean time a viper will kill Scorpions, as well as Lizzards, and other animals to devour them and feed upon them, but that ſhe doth only, when ſhe is at liberty, and not when impriſon'd; for then ſhe ceaſeth to take food.

We have likewiſe found the contrary to what Authors have affirm'd of the *Waſpe's* attaching a Viper, and that the former would fix its ſting into the head of the latter, and quitted her not, till ſhe were dead.

Divers Authors have aſſur'd, that all the remedies, which are reputed Alexiterial, or Preſervatives againſt poiſon, did kill Vipers, by their vertue contrary and oppoſite to their venom. To be certain hereof, we forced a Viper to ſwallow half a drachm of *Theriaque*, diſſolved in *Carduus Benedictus*-water; and having laid her aſide, we perceived not any change in her,

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except that the ſurface of her skin appear'd for a while a little moiſt; but ſhe grew more vivid upon it, and more ready to bite than before.

We had alſo a minde to know the effect of *Spirit of Wine* upon a Viper. We therefore made one ſwallow about a drachme of it; which thereupon was preſently ſtun'd, and then fell into ſtrange agitations; but ſeeing that that ceaſed little by little, we gave her another doſe of the ſame quantity, which not onely caus'd in her the like agitation, but afterwards made her almoſt un-moved, and ſo inebriated her that ſhe ſeem'd to be half dead. She remain'd about three hours in this condition, but at length ſhe began to ſtir again, and was like the former, more brisk, and more diſpoſed to bite than before. We put alſo a living Viper into a bottle almoſt full of Spirit of wine, and we ſaw, that ſhe turned to and fro therein, now ſwimming on the top, then in the middle, and by and by at the bottom of the bottle, and that ſhe reſiſted a good hour, before ſhe was choaked therein.

We cauſed likewiſe a Viper to ſwallow ſome ſugar, part of which was in powder, and

and the other part diſſolv'd in water. She kept the whole for a while with her, but afterwards vomited it up; and having laid her aſide, to ſee, what would become of her, we found her dead four and twenty hours after.

We have often ſpit into the throats of many Vipers, even when we were faſting, but they ſoon after caſt up our ſpitle, and had not any hurt thereby; though there be Authours affirming that Vipers become tabid or conſumptive thereby; which yet may very well happen, not from thence, but rather from the abſtinence and ſadneſs, after a long impriſonment.

Many Authors have mentioned, that Vipers have a great Antipathy to *Aſh*-wood, and that, if a live Viper were put within a round, made, one half, of the leaves of Aſh, and the other half, of kindled coales, the Viper would rather expoſe herſelf to be burnt, then to come near the Aſh-leaves. But having made a whole round of ſuch leaves, which had about three foot in diameter, we put a Viper in the midſt, which preſently hid herſelf under thoſe leaves.

Whileſt I had live Vipers in my houſe,

ſeveral Women with child came to me, ſome deſignedly to ſee them, others without having any ſuch thought, and even being ſurpris'd at, and abhorring the ſight of them; but none of them having been inconvenienced by it; ſo far were they from miſcarrying thereupon, as certain Authors would beare us in hand they would do. Not that ſuch a thing may not chance to happen to ſome woman or other extraordinary fearful, and of a temper ſo delicate, that a much leſs occaſion might produce ſuch an effect; but that ought not to paſs for a general rule.

We have often preſſed ſome Vipers, both Males and Females, at the place, where be the *Paraſtates*, or the Bladders containing the ſeed, namely under the tail, and near the openings, which ſerve for generation; and have ſo much and ſo long preſs'd them, that a white liquor came forth; but we never perceived there any piercing or ill-ſented ſmell, no more than we did in opening thoſe *Paraſtates* with a lance, though we held our noſe cloſe to it: which is alſo directly contrary to what ſome Authors have aſſured thereof.

CHAP.

CHAPT. VIII.

GENERAL REFLEXIONS

Upon all we have experimented.

THE great care and attention uſed by us in the Experiments, we have hitherto deſcribed, and in thoſe, we have thought fit to ſuppreſs, hath made us to profit of all the occaſions, that preſented themſelves; and we have taken pleaſure to obſerve all the effects, that have appeared to us, and carefully examined them, and inquired into their cauſes afterwards, that we might make our reflexions thereon.

The Biting of the Viper, which hapned to the Gentleman Stranger, began to furniſh us with much matter; and at that time we knew the Venom by its effects, which ſeem'd to proceed from a very ſlight cauſe, it being nothing but a little pricking, and onely the cut of a tooth, which was not any thing deep, and the ill of

which did not seem to us increased by any of the yellow liquor of the Gums, the innocence of which was not yet fully known to us. In the mean time the mortal Accidents came on in great number, whilst continued vomitings hinder'd the effect of the remedies, which could not be kept in the Stomach, to communicate from thence some of their vertue to the parts affected. It was well enough known, that there was something very subtile, very quick, and very powerful in this Venom; and it was also presumed, that that resided in the Spirits; but the nature of it, or by what means, or how, or on what parts it acted, was not known so well.

Yet we must avow, that on an occasion so pressing, so dangerous, and so extraordinary, we could not take our measures better than by having recourse to the Volatile Salt of Vipers. The cause being subtile and spirituous, there was required a remedy of the like nature, that might be able to make haste to finde it out, to joyn with it, and to draw it to the extremities of the body, and to make it come forth by the wayes, it had opened for it. But then, the continual vomiting demanded

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the aid of ſuch a remedy, that could work in a moment, or execute at leaſt by ſeveral takings, what it was not able to do at the firſt. The happy ſucceſs, which attended the uſe of this Volatile ſalt of Vipers, acquainted us with the ſufficiency thereof, and ſhowed us the maſtery it had over the malignity of thoſe Spirits. It alſo begot in us a deſire to know aright, in what manner it produced ſuch good effects, and to be enabled ſo to diſcourſe of it, as that others might have no reaſon to reject our ſentiments.

We eſteem therefore, *that* this Salt, by its ſubtile, volatile and piercing quality, is very proper to diſſolve the coagulations of the Bloud, and to ſever the parts, which therein were congeal'd or fix'd, (if we may ſo ſpeak) and caus'd the diſorder and confuſion of its motion; *that* it performed this in the Blood of the ſaid Gentleman, which it reſtor'd to its former condition, and ſo gave again to the parts the free communication of the Spirits, which they had loſt. We believe alſo, that this Volatile Salt, by the facility it had to hook and faſten it ſelf unto thoſe vexed Spirits, as being of the like nature,

did eaſily joyn with them, and drove them to the extremities of the body, drawing them forth through the pores of the skin, and iſſuing out with them by the way, it had open'd for them.

The Ligatures made about the place bitten, the Scarifications, and the approach of the well heated iron-ſpatuls to the wound, were to ſerve to ſtay the impetuouſneſs of thoſe irritated Spirits, and to give them an out-let at theſe openings, rather than that they ſhould go farther: And the exhibition of the Theriaque, the Viper-powder, and the like, was to conduce to drive them back, as it might have done, if theſe remedies had ſtay'd in the Stomach. As alſo the *Epithemes* of Theriaque upon the Heart and Stomach might have ſerv'd much, if the action of the enrag'd ſpirits had been more ſlow, and if at the time of their application thoſe ſpirits had not been too farre advanced.

But the Uſe of this Volatile Salt was to carry the Bell, as it did, from all the other remedies; and thoſe, that were employ'd afterwards and in the intervals of its exhibition, were nothing, if we may

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ſo ſpeak, but Souldiers aſſiſting their Captain; ſuch as the Confection of *Alkermes* and of *Hyacinthe*, which were very proper to fortify the noble parts; as alſo were the Syrup of Limons, and the Decoction of Scorzonera, and the ſhavings of Ivory.

The Slices of Citron, which might ſeem to ſome by their acidity capable to augment the coagulation of the blood, were not given till after the Volatile Salt had uſed its force to diſſipate it; and they ſerved to recover the Stomach, debilitated by continual vomiting, and by their acidneſs to reſtore the loſt appetite, and to help the concoction of the aliments, and their diſtribution into the parts, that had need of them. Beſides that Citrons have a ſpecifique vertue againſt the poyſon of Vipers, if we will believe thoſe Authors, that have written of it; and is a great friend to the Heart and the other noble parts.

The Anointing with the Oyle of Scorpions of *Matthiolus*, and with the water of the *Queen of Hungary*, made upon the ſwell'd parts, and the application of Alexiterial fomentations, ſhould in all appearance have ſerv'd much; but the ſequele

ſhew'd, that there was nothing but that Volatile Salt, which could make thoſe angry Spirits ſurrender, and ſo was to take the honour of all.

The Experiments, which we afterwards made upon a great number of differing Animals, have given us a much greater knowledg of the effects of Vipers-poyſon, of the parts on which it works, and of thoſe that ſeem to be exempt from it, though at laſt they do ſuccumbe: We have ſet down the moſt conſiderable of them, making ſome reflexions on the biting of ſeveral Doggs, done by Vipers; but there remain'd ſtill for us to diſcourſe, Why and How the parts of Vipers, being eaten, can ſtop and overcome the Venom of their biting.

We ſay therefore, that all the parts of a Viper abound chiefly in Volatile Salt, which in diſtillation is found partly alone; partly in the form of a Spirit, which properly is nothing but a Salt diſſolved in ſome portion of Phlegme; and partly in the form of an Oyle, which alſo is but a Salt mix't among the unctuous part of a Viper. We ſay alſo, that in the digeſtion, made in the Stomach, of the parts of a Vipers body

body, that have been ſwallowed down, this ſame Volatile Salt, which they contain, is ſeparated, and afterwards diſtributed to all the parts that need them; eſpecially if of theſe parts there have been ſwallow'd enow, to furniſh that quantity, which is neceſſary, of this Salt; and ſo we need not doubt, but that this Salt will produce an effect like that of the Volatile Salt, which was given to our Gentleman bitten; Unleſs it ſhould be ſaid, that this ſame Volatile Salt of thoſe parts of a Vipers body, which have been ſwallowed, being of the ſame nature with the irritated Spirits, attracts them to it ſelf, and by this union changes their maligne quality, and ſo tames them, that they have no power over the bitten Animal; which, in my opinion, is hard enough to conceive, and perhaps eſtabliſhed upon unſolid foundations.

We hope, that among the many Experiments, thoſe of the Five Pigeons, bitten one after another, by one and the ſame Viper exaſperated, and of which the laſt bitten dyed firſt of all, when the Viper was moſt vexed, and moſt exhauſted of its yellow liquor; and that of the Pigeon bitten by

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Viper, which we had cauſed to bite ſeveral times into bread before, and that even till bloud came forth, to the end that the Juyce might be well emptied of it, and which notwithſtanding was followed by the death of the Pigeon; Theſe Experiments, I ſay, will prove on one hand, that the yellow liquor contributes nothing to the poyſon; and on the other, that theſe incenſed Spirits, aſſiſted by the openings which the great Teeth had prepared for them, are the ſole and true cauſe thereof.

The wound, made by a Viper not vexed, whoſe jaws were held in, and whoſe teeth were at the ſame time thruſt into the body of a Pigeon, which alſo was accompanied with ſtore of the yellow juyce, and yet not attended with any ill accident; as alſo the pricking, made by the great teeth, pulled out of a live Viper, or by ſuch, as ſtuck yet in the head of a dead Viper, and did no hurt at all, do ſufficiently confirm this truth, viz. that the cauſe of the Venom is to be imputed to the Spirits enraged, and not to any other thing or parts in the Vipers body.

I have not undertaken to reaſon upon all

all the Experiments, we have made, as I have done upon the Bitings, both becauſe that is beyond the Sphere of a man of my profeſſion, and becauſe I deſigned onely to confine my ſelf particularly to the wounds and to the Remedies able to heal them.

For the reſt, if in the Treaty concerning Theriaque, which I have lately publiſht, I have advanced any thing not conſonant to what I have declared here, touching the action of the Venom, I am to be excuſed therein, foraſmuch as I had not then had the occaſion, well to know the nature and the effects of the Bitings of Vipers, and referred my ſelf to the moſt approved Authors about it. But yet all we have there ſaid, derogates in nothing from the preparation of Vipers for Theriaque, which we have there laid down, and which was in that Book our main deſign, as well as to reform ſeveral other preparations, that ſeemed not reaſonable to us: That which now remains to be done by us, is, to ſpeak of the Remedies to be drawn from Vipers, which may ſerve to heal their bitings, and to cure many other evils.

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THE REMEDIES EXTRACTED FROM VIPERS.

CHAPT. I.

Of the different choyce that may be made of the parts of a Viper.

THere is nothing in Nature, to which can be given more juſtly the title both of *Aliment* and *Medicine*, than to a Viper, ſince it affords equally very good Nouriſhment and very good Remedies. It alſo hath in its Body not one part, which is not very uſefull, and of which Artiſts may not draw ſomething

thing that is good; their chief difference conſiſting in this, that the ſubſtance of the one is more or leſs cloſe, then that of others. Yet, as in all Bodies of Animals, there are parts preferable to others, ſo we may make a diſtinction of thoſe in a Viper, eſpecially if we mean to eat them, or to reduce them to powder, to take it at the mouth, alone, or mingled with other medicaments.

In this caſe, it will be well, to uſe only the Heart, the Liver, and the Trunk, I mean, the Body emptied of its guts, without head and tayle. Not that, if you would make uſe of the head and taile, any ill would attend it, or that you need to fear any ill quality in them, no more than in all the other parts of the body; but the Heart, Liver and Trunk are choſen, as thoſe that are moſt eſteem'd, and which are taken before the reſt, out of the body of ſuch Animals, which men uſe to feed upon. Thoſe alſo, that would nouriſh themſelves with Viper-fleſh boyled and ſeaſoned, may do well, in eating of it, to ſeparate the bones thereof, and to leave them uneaten: but if they bruiſe them between their teeth,

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and ſwallow them down together with the fleſh, they would afford them a like, and even a ſtronger nouriſhment than the fleſh: for, we have found by Diſtillation, that the Bones yield the ſame parts, that the Fleſh does and even in greater quantity. For the ſame reaſon, the Bones of the trunk are not to be caſt away, when you will prepare the powder of Vipers, and that the rather, becauſe they are in that way very eaſy to ſwallow. One may alſo very uſefully dreſs the fleſh of Vipers with their own fat, as one would do with butter, or with the fat of other animals. The Skin it ſelf, if men would, might be boyled and eaten with benefit; but that it would not be ſo ſavory, as the principal parts we have been ſpeaking of.

As for the *Chymical* preparations, all the parts of Vipers may be therein employed, and I would not except from them the Stomach it ſelf, nor the Inteſtins, if they were well clear'd of Worms, and all Excrements.

I alſo know no difference, as to goodneſs, of one Sex from the other, although moſt Authors have preſcribed the uſe of Females: On the contrary, if there be any

any ſuch difference, I would preferre the Males to the Females, when theſe are full of Eggs, and big, foraſmuch as then they are too much waſted for the feeding and increaſing of their Eggs.

As to the Seaſons, in which they are to be taken and uſed, I almoſt equally conſider the *Spring* and *Autumne*; for the times wherein men need them, ought to carry it in the behalf of thoſe who have a mind to feed on them. But care muſt be had to chuſe ſuch Vipers, as are bigg, fat, vigorous, and active; and not to keep them very long after they have been taken, becauſe they grow leaner and leſſer every day, both out of Melancholy, and want of food, which after that time they uſe not to take. I alſo make no difference between thoſe Vipers of *France*, that are bred in one Province, and thoſe of another; for thoſe of *Poitou* and the neighbouring parts are as good as thoſe of *Dauphine* and about *Lyons*, and in other places. The place therefore is not to be conſidered but for the quantity, and for the conveniency of getting them, in regard that they are not wont to be found in maritime places, which are the onely, that

Authors

Authors have disapproved for Vipers, upon the belief, that the flesh of Vipers, taken in them, did cause thirst, by reason of the saltish food, they met with there.

CHAP. II.

Of the Use of the parts of Vipers, in respect of their nourishing Vertue.

THere is scarce an Author, that hath written of Vipers, but affirms, that in several parts of the World, many persons, and even whole Nations, have fed, and still feed upon the flesh of Vipers; in somuch that in great and costly Entertainments, they made exquisite and very considerable dishes of it. There are also, that have alledged for an example some Nations, which by the use of Viper-flesh, have

have extraordinarily lengthn'd their life, even to 140. years. It is needleſs, to inſert here the teſtimonies of Antiquitie on this ſubject; the Curious may finde them in Books. We content ourſelves to affirm, that many perſons do ſtill uſe it at this time in divers Countries, whether it be from Cuſtom, or to ſatisfie their appetite, or by the Advice of knowing Phyſitians, and that upon occaſions they finde wonderful effects thereof. I alſo doubt not, but that the uſe of it would be more frequent among us, if the vertues of Vipers were well known, and if one could diſlodge out of the minde of people the horrour and natural antipathy, they have againſt this animal. For the taſte of Viper-fleſh is very like that of Eeles; whence it is, that in ſome Countries Vipers are called *Eeles of the Mountain*; and one finds ſomething in them even more ſavoury than in Eeles. I know perſons, who well knowing the moſt inward parts of Vipers, have out of merriment, and in company, made good meals of them, and found it very ſavory meat. But thoſe that have too much averſion from this kind of food, may find very convenient

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wayes to benefit themſelves by the vertue of them, ſo as not to be diverted from it by any abhorrency of the animal: for they may feed Capons and Pullets with the fleſh of Vipers cut in ſmall pieces, which thoſe Creatures eat very greedily; and continuing for ſome time to feed them therewith, it will certainly communicate the vertue of the Vipers to the body of thoſe Animals; which may be eaten, as we eate other Capons or Pullets, the taſte of which will be very ſavoury, becauſe that of Viper fleſh is ſo.

Neither ought we to doubt, that the qualities of Vipers paſs into the bodies of thoſe animals, ſince there are innumerable others, the fleſh of which hath not onely the vertue, but even the taſte of the things, they are fed with. The fleſh of the Birds, that live on Juniper-berries, and of thoſe, that live onely upon Olives, hath not onely their qualities, but alſo their taſte and bitterneſs, and that ſo highly, that one can ſcare eat them. In the Countries, where Silk-worms are bred, it is obſerved, that in their ſeaſon, which is chiefly in the months of *May* and *June*, the Eggs of Hens, that eat thoſe Worms, have

have a taſte and ſmell of them, as well as their fleſh; inſomuch that nice perſons feed their Poultry a part, and hinder them from eating any Silk-worms. It may be taken notice of, to this purpoſe, that 'tis a cuſtome to give to Nurſes the medicines, which young Children cannot be made to take, to the end that their vertue may paſs from the body of the Nurſe to that of the Child; and it hath been often obſerv'd, that the Urine of the Babe hath had the ſent of the Druggs the Nurſe had taken.

But yet ſome might phanſy, that Animals cannot take the good from the good parts of the things eaten by them, but they muſt at the ſame time receive the impreſſions of the ill ones, that are there; and it might even be objected, that Lizzards, Scorpions, Cantharides, and the other Creatures, on which Vipers do feed, ſhould impreſs in their bodies the ill qualities, they have, as, among the reſt, the Cantharid, its Cauſtique quality. But notwithſtanding all this, the Experience we have of the harmleſsneſs of Vipers-bodies, and alſo of their good qualities, furniſhes us with a contrary argument, ſuf-

ficient to deſtroy that phanſy; and it teaches us, that the ſtomach of Animals converteth into good all the ill qualities, to be met with in the bodies, it receiveth to digeſt; and that it uniteth and appropriateth the good ones to the very ſubſtance of the Animal that hath eaten them: Whence it comes to paſs, that it is as 'twere transformed, or at leaſt very much changed by thoſe good qualities; and is upon that account capable to communicate them to other animals, into whoſe ſtomach it enters to be there digeſted. We ſay beſides, that there are divers Examples of Bodies, that would be altogether poyſonous in the ſtomach of men, which yet ſerve for food to, and fatten, other animals, which afterwards yield good nouriſhment to men. Such are *Hellebore* and *Hemlock*, which nouriſh and fatten Quailes and Goates, which afterwards are uſefully employed for the nouriſhment of men; and this is it, what *Lucrece* hath very well obſerved in theſe Verſes;

Præterea nobis Veratrum *eſt acre venenum,*
At Capris adipes & Coturnicibus auget:
Quipp[illegible]

Quippe videre licet pingueſcere ſæpe Cicutâ
Barbigeras pecudes; homini quæ eſt acre Venenum.

But thoſe, that have no averſion from Vipers-fleſh, may take of them the Heart, the Liver, and the Trunck, and having waſhed them well, they may then accommodate them to their own taſte in the dreſſing. Where they are to take care, not to make the fleſh too hot by too much ſpice eſpecially pepper; but yet they are allowed to put to it ſome aromatique herbs, as Garden- and Wild-Thyme, and the like; or a little Nutmeg, Cinamon, Cloves, to raiſe the taſte. They muſt alſo avoid the fault, committed by the Antients, whipping and vexing the Vipers, before they killed them; leaſt this irritation ſhould cauſe ſome ill impreſſion in their body, which by it ſelf hath no venom at all in it. Let them alſo not caſt away the broth, wherein the Vipers have been boyled, becauſe it retaines the greateſt vertue of them. Neither do I ſee, why one ſhould ſtint the quantity, or limit the time of the uſe of it; that depending from the degree

of the illneſs, and from the conſtitution of the perſons, that will make uſe thereof. And although we know Vipers to be a very Alterative Medicine, and that their chief uſe is onely for their Medicinal qualities; yet if taken as an Aliment, there is no danger at all to eat of their fleſh, or to drink of their broth, ſomewhat more or ſomewhat leſs. It is alſo to be moderately ſalted; and thoſe that have any of the Fixed Salt of Vipers, ſhall do well to employ it. You may alſo adde to it ſome of its Volatile Salt, if you will have the Fleſh of Vipers work more powerfully.

As to the *Vertues* of Viper-fleſh, according to the conſent of innumerable Authors, whoſe opinion is ſupported by reaſon and truth, confirmed by many Experiments; we can ſay, that they are very great, and that there is no Animal in Nature, that affords ſuch and ſo many: And we wonder not at all, that the Antients have ſo frequently employ'd Vipers in their *Hieroglyphicks*, and adorned their *Medals* with them; thereby to deſign very advantagious things for the publick, and for private men; forasmuch as this Animal is very capable to furniſh them. For the

the uſe of it preſerves the natural heat in a very good temper, it repaireth the ſame, and reſtoreth it when 'tis altered; it yields a very good food; helps digeſtion by its heat, which is not exceſſive; it retards old age and prolongeth life, by a property, which Vipers have, to maintain in good plight the whole habit of the Body. Whence it is, that many have believed, that both Staggs and Eagles, induced to it by a natural inſtinct, eat all the Vipers, they can meet with, and that 'tis upon that ſcore, that their life is extraordinary long.

There is alſo adſcribed to Vipers, and not without reaſon, a Renewing vertue, capable to make young again; which they tacitly ſhew, by caſting their skin twice a year, and renewing themſelves by the cover of a new skin. This, joyned to the ſubtile parts, of which the Viper is compoſed, and to its lively and daring aſpect, teſtifies it to be pertinent enough, that Authors have attributed to it the vertue of clearing and ſtrengthning the Eyes.

Vipers have alſo a very particular vertue of Cleanſing the whole Body, and particularly the Bloud, and of expelling

through the pores of its skin all the superfluities: Whence it may be inferred, that they are very proper to cure the *Itch*, *Tettar*, *Eryſipelas* or Saint *Anthonies* fire, *Meaſels*, *Small Pox*, and the *Leproſy* it ſelf, the uſe of them being long enough continued; though I cannot well believe what *Galen* ſaith, That the Wine, wherein one onely Viper is choaked, is able to cure ſo great an Evil, and which doth not ſo eaſily yield to remedies.

Vipers alſo may, by removing all the impurities and obſtructions of the Body and skin, cauſe beauty therein; and upon this account it is, that many Ladies in *Italy* uſe them for their ordinary food.

By the good nouriſhment, they yield by the purity they give to the blood and to all the parts, and by the liberty they give to the Spirits to do their functions therein, they are a great relief to perſons in a Conſumption, and to thoſe that are emaciated by long diſeaſes, and waſted by tedious Feavers. There are even Authors, who aſſure that the uſe of them is capable to cure the Venereal diſeaſe; for which we doubt not but they may ſerve much, if they do not altogether cure it.

Their

Their mundifying vertue, joyned to the Alexiterial, makes them also very proper to expell all sorts of poysons, and even the Plague it self and all contagious diseases. They are also very contrary to all putrefaction, which commonly is the matter and source of most maladies; whence it comes, that those who use them, are not subject to diseases, unless they live irregularly, which is able to destroy all the good, which the use of Vipers might afford.

We might here specify many other sicknesses, that might be cured by the use of Viper-flesh; but we think not fit to do so, since the general vertues, which we have noted, may suffice to make men apply the use to many particular Evils, that may need it. Yet we shall describe, in the Chapter ensuing, the uses and Vertues of the parts of Vipers, taken as a Medicine, without any great preparation.

CHAP.

CHAP. III.

Of the Vertues of ſeveral parts of the Viper, and of their Uſe in Phyſick.

THE Vertues, which the *Fleſh* of Vipers is able to communicate to thoſe, who eat them for nouriſhment, are doubtleſs very conſiderable; but they are not the onely ones, that Vipers are endow'd with; and not to alledge ſuperfluous things, we ſhall confine our ſelves to the principal Vertues, of which we have experimented the greateſt part.

It is very certain, that the *Head* of a Viper, broyled and ſwallowed, healeth the biting of that animal. The Heart and the Liver may do the ſame. Reaſon and Experience have confirm'd it; and therefore in

in an urgent occaſion thoſe parts may be very uſefully employed. The application of the Blood of a Viper to the Biting, as alſo that of its Head bruiſed, are neither to be rejected, nor is that of the Entralls: but theſe applications alone are not capable to cure it; for, the ſubtlety and quicneſs of the Spirits carrying them with great ſpeed into the body, there muſt be uſed internal ſpecifick remedies to repulſe them; and you may alſo very pertinently repeat (at the mouth) the uſe of the head, heart, liver, and the other parts of a Viper, without fearing to take too much of them, becauſe thoſe parts can never do hurt, and they alwayes produce ſome good effect. They may alſo ſerve for all ſorts of venoms and poyſons, and againſt all ſorts of contagious and epidemical diſeaſes.

Divers Authors aſſure, that the *Head* of a Viper, hung about the neck, hath a very particular quality to cure the Squinancy and all the diſtempers of the Throat; and that the Brain of a Viper, wrapt up in a little skin, and likewiſe hung about the neck, is very good to make the Teeth of children come forth; which effect

others

others believe to be due to the great teeth of Vipers. If we had experimented it, we could then ſpeak with more certainty. The remedies are eaſily practicable, and withal harmleſs; wherefore thoſe who need them may make tryal of them.

Some alſo have affirmed, that the *Liver* of a Viper, ſwallowed, keeps one from being bitten either by this Animal, or by any other ſerpent, and that the powder of Vipers hath the ſame efficacy. But we muſt not rely upon their report; we onely believe, that the Liver ſwallowed is capable to heal the biting of a Viper; like the heart, fleſh, and other parts, of which we have ſpoken; and that it may much facilitate the delivery of Women with child, as doth the Liver of Eeles.

The *Skin* of a Viper is not altogether deſtitute of vertue; for beſides that it is alſo, as they ſay, very good for the delivery of women, making a garter of it about the right leg, it hath a very ſingular vertue for all the diſtempers of humane skin: And although all the other parts, eaten, may work the ſame thing; yet, that we might have benefit from all, we have experimented, that the Viper-skin does perfectly

fectly heal the inveterate mangie of Dogs, making them eat it boyled or raw. It might alſo be ſaid, that the ſpecks in the Viper-skin ſeem to ſignify the marks of the itch or mangy, or, if you will, of the leproſy, which the ſcales of the skin repreſent yet better, and ſo tacitly expreſs its vertue.

Some have believed, that the *Gall* of a Viper applyed, can heal its biting; but we give no credit to it, no more than to the application of its bruiſed head. But this we judge, that it is proper for the wound of the biting, onely as it is for all other wounds, and for ulcers themſelves, having a great abſterſive, mundifying and cicatrizing vertue. It is alſo very good for the weakneſſes of Eyes, above all, for ſuffuſions and films, being taken inwardly, or applied outwardly; ſo far it is from doing them hurt.

The *Fat* of Vipers hath very great vertues; for, beſides that it is very good in the dreſſing of the Viper-fleſh (as hath been ſaid) it is able alſo, taking a drachm of it, to give great relief in Epidemical diſeaſes, and to expell the venom thereof. It is alſo very uſeful to facilitate the travel of women; and to diſſipate the ſwellings of the

the throat, anointing it outwardly therewith. It also much relieves Gouty persons, and serves to resolve nodosities. It unswels all hard and inveterate tumors, and even those that proceed from Venereal diseases; and for this reason 'tis, that *Jean de Vigo* hath used it in the Plaister which bears his name. It is likewise very good for Burnings, pustuls, and all distempers of the skin; and lastly, it is very powerful against all the illnesses of the Sinews, and of great vertue for the parts attackt by the Palsy. We might also adde many other vertues, adscribed by Authors to other parts of the Viper; but we forbear, because we have not experimented them.

CHAP.

CHAPT. IV.

Of the Powder and Trochiſques of Vipers.

SInce we do not alwayes meet with perſons, who, having need to make uſe of Viper-fleſh, are diſpoſed to eat thereof; it is very neceſſary to have ready ſuch remedies, that be as well accommodated to the inclination of the Patient, as fitted to remove the malady. The knowledge, which Phyſitians have had of the great Vertues of the Viper, joyned to the difficulty, met with in the point of pleaſing Patients, hath obliged them to ſearch for divers Preparations, in which the Antients did not well ſucceed; and if we would bind ourſelves to their way of preparing the *Powder* and the *Trochiſques*, we ſhould looſe the principal vertue of the Viper, and retain onely the moſt uſeleſs. For, in the opinion, which they entertained,

ned, that there remain'd alwayes ſome venom in the fleſh of the Viper, if it were not freed therefrom by ſome preparation or other; their practice was, to put the fleſh of Vipers in ſome earthen pot, and having luted it, to ſet it in a Bake-oven, after the Bread was drawn out, and to leave it there, till this fleſh was reduced to powder. In which preparation the beſt of this fleſh, which is the Volatile Salt, was certainly diſſipated. They alſo made ſeveral medicines with this powder, mixt among other medicaments divers wayes; of which we need not to enlarge. We ſhall content ourſelves, here to ſet down a preparation of the *Powder* of Vipers, which ſhall be grounded on Reaſon, and ſhall retain all the vertues of the Viper; eaſy alſo to prepare, and very convenient for the Patient to uſe.

Take then towards the end of *April*, or in the beginning of *May*, ſuch a quantity of Vipers as you pleaſe, Males and Females, chuſing big ones, and ſuch as are fat and vigorous, and uſing none of thoſe Females, which are already big with eggs; and then prepare thoſe, you ſhall have thus choſen, as follows: Without whipping and vexing

ing them, cut off, with a pair of ſizers, their heads and tailes, flea them, and empty them of all their entrals, of which you are to ſeparate the heart and the Liver; and lay aſide their fat for its peculiar uſes. Waſh the trunks of the bodies, the hearts and livers in clear water, and after that in white wine; then dry them with a very clean linnen cloth, and having put the hearts and livers again into their trunks, tye all the trunks with ſmall pack-thred, each at one end, and hang them up in the air in the ſhade, and leave them there, till they be well dryed; which will be in three or four dayes. After that, cut theſe trunks into ſmall pieces, and ſtamp them in a great Braſs-mortar with an iron-peſtle, and ſearce all through a very fine hair-ſive, and ſo keep it for uſe. This is the right Powder of Vipers, which contains all the vertues; to which may be added a drop of Cinamon-oyle, to give it a good ſcent.

There are ſome, who, to make this powder would have the trunks of Vipers cut in pieces, and put together with their hearts and livers in a Glaſs-cucurbit, and this covered with its head and luted, and

ſo placed with a recipient, in a very gentle *Balneum*; thereby, continuing that warmth for three dayes together, to draw the phlegm of Vipers, accompanied with a ſmall portion of the Volatile Salt, and to keep this liquor apart; and then to take out of the Cucurbite what ſhall remain there, and of it to make the powder of Vipers.

But, beſides *that* this method is troubleſome enough; *that* the fire of a *Balneum* is not ſufficiently ſtrong to ſend forth enough of the Volatile Salt, at a time when 'tis not yet looſen'd from its ſubject; *that* 'tis notwithſtanding too much ſo, not to emit inſenſibly ſome ſmal portion, which would afterwards be wanting in the Powder, and which alſo may exhale out of the water; beſides alſo *that* the Vipers are in danger to be too much dry'd in the Cucurbite, and even to be there roſted in part: We eſteem, there is cauſe to prefer *our* Preparation to *this*, in regard it is much eaſier, and, without any deſtruction or alteration of the good parts of Vipers, carries away all their ſuperfluous and uſeleſs humidity.

You might notwithſtanding follow this way

way in part, if you ſhould deſire to have good Viper-water; but then you muſt increaſe the fire of the *Balneum*, and finiſh the diſtillation in much leſs time, and yet take heed not to haſten the fire too much at the latter end, leaſt the water ſmell of the *Empyreuma* or burning. You muſt alſo, after you have taken out the parts of the Viper, that reſt in the Cucurbite, put them into a glaſs-retort well luted, and ſet this into a reverberating furnace, dapt and exactly lute to it a great Recipient, and give it a fire increaſed by degrees, and hotter about the end, to obtain the Volatile Spirit, Salt, and Oyle, that could not riſe by the fire of the *Balneum*; which are to be ſeparated and rectifyed, as we ſhall ſay hereafter. Then take a portion of this Volatile Salt well rectified, and diſſolve it in diſtilled water, and keep it carefully in a well ſtopp'd bottle, as an excellent remedy; of which you may increaſe or diminiſh the doſe, according to perſons and occaſions; and according as you ſhall have diſſolved more or leſs of the Volatile Salt in it.

Upon this occaſion, I thought fit to advertiſe thoſe, who diſtill Capons, Partridges,

tridges, ſlices of Veal, or other parts of Animals, in a Glaſs-limbec (as the cuſtom is,) and who employ for that purpoſe the fire of a *Balneum*, or that of Sand or Aſhes; that by a moderate fire they cannot make riſe almoſt any thing but uſeleſs flegm; and that, not being able to increaſe the fire without making the diſtilled water ſmell of the *Empyreuma*, they would ſucceed better, if in this they did, what I was juſt now ſaying of the water and volatile Salt of Vipers; and if they joyn'd their water with the volatile Salt of the diſtilled Animals, in which reſides the chief vertue. Thoſe, that have no mind to take ſo much pains, ſhall do better not to give diſtilled waters to their Patients, as the cuſtom is, ſince they have no vertue at all, if none be communicated to them by the volatil Salt of the Animal,

As to the *Trochiſques*, the Antients have as ill invented, and as ill ordered them, as the *Powder*. For, not to ſtay to blame here (as I have done elſewhere) the whipping, which they uſed, and which was not onely uſeleſs, but alſo very noxious; I ſhall ſay in a few words, that the decoction, they made of the body of the Viper

Viper in Water, with Salt and ~~Anise,~~ Dill till the fleſh would ſever from the bones, which they afterwards caſt away as well as the broth, was not a *Preparation* of the fleſh of the Viper, but rather a *deſtruction*, ſince it was made to leave its principal vertue in the broth; and that they weaken'd it yet more, by incorporating it with very dry bread, of which the proportion of a fifth to four times as much weight of fleſh, though but little in appearance, came yet to a moiety, ſince that four ounces of this fleſh, and one ounce of bread (which was ſo dry that it could not be leſſened) make onely two ounces of *Trochiſques*, when they are well dry'd. This we have more at large examined in our Treatiſe of the *Theriaque*; and becauſe their fault is very eaſily underſtood, I ſhall inſiſt on it no farther; nor on their reaſons for making uſe of Boyling to correct a malignity in the fleſh, (of which there is none) and to be able to ſever it from the bones, which they believe naught, or at leaſt unuſefull, which yet are very good; foraſmuch as all their reaſons are ſufficiently refuted in the ſame Book, and becauſe they are yet more ſo, by what we have eſtabliſh'd in this.

And

And although it be not alwayes neceſſary to make *Trochiſques* of Vipers, ſince we might be without them; yet there being ſome uſe of them, and to preſerve their name, you may take a little Gumm Arabique, very white and pure, and reduce it to powder, and infuſe it in good Malvaſy, till it be well diſſolv'd, and the wine ſomewhat tinged thereof: then take of the powder of Viper, prepar'd as we have lately directed, and incorporate it with a ſufficient quantity of this gumm'd Malvaſy, braying them together in a Marble-mortar with a woodden-peſtle, and ſo reduce the whole into a ſomewhat ſolid paſte; whereof make Trochiſques, of the ſize and ſhape you pleaſe, and dry them in the ſhade upon a hair-ſive.

I ſaid, that we might be *without* Trochiſques, becauſe that having the Powder, which they are made of, that may ſuffice for our uſes; but there is one inconveniency in the Powder, in that it will ſcarce keep any conſiderable time, eſpeally if it be not well ſtopt up, and if, beſides, ſome art be not uſed to hinder the breeding of worms in it: Whereas Trochiſques, being made compleat by the addition

dition of Malvaſy, and by the cloſe compreſſion of the parts of the Powder, they are not ſo eaſily penetrated by the Air, nor ſo ſubject to corruption. The Trochiſques being dry, they may be ſlightly rubbed over with a little Balſom of *Peru*, which will give them a good ſcent, and help to preſerve them.

The Uſe both of the Powder and Trochiſques is excellent and alike; but the Trochiſques are to be reduced into powder, when they are to be uſed. Neither of them have an ill taſte, and they contain all the vertues, we have aſcribed to the Fleſh of Vipers, as having loſt nothing in drying, made without the heat of the Sunbeams, but a ſuperfluous moiſture, which could ſerve for nothing but corrupt them, if it had remained. They may be given in cordial waters, broths, wine, or ſome fit decoction, or you may make *Bolus*'s of them with Syrrups, Conſerves, or Cordial Confections, or turn them into tablets with ſugar.

Their main effect is, to purify, open, penetrate, and to drive to the extremities of bodies all venom, corruptions, impurities, ſuperfluities, and they may be very bene-

ficially uſed in many occaſions for divers maladies, without the fear of any ill ſucceſs. For both have this quality, that they do alwayes ſome good, but never any harm. Their doſe is from a Scruple to a drachm or two; and they may be given to all ages, and ſexes, and at all times.

CHAPT. V.

Of the Salt of Vipers made by the Ancients.

AMong many different Preparations of the Salt of Vipers, made by the Ancients, of which we finde the deſcriptions in their Books, there is none more famous, nor that hath been longer in uſe, than one that is very ample and much enriched by many Alexiterial remedies; whence tis alſo, that they gave to this Salt the name of *Theriacal*. But having conſidered this pompous Preparation,

on, we do not wonder, that a much eſteemed Author hath not given it his approbation, ſince we cannot finde any thing in it, that is according to rule or reaſon, no more than there is in the reſt. We finde, that the ſentiments of that Author proceed from an underſtanding ſo judicious, and ſo knowing, that we cannot but ſubſcribe to them, almoſt in all: For, in the Calcination, they uſed, there remain'd nothing but the *fix't* Salt, which contains but very little vertue; Vipers, as all ſorts of Animals, having but little of Fixt Salt, whereas they have much of the Volatile, which ſoon riſeth in the Calcination, and carries away with it the principal and the moſt eſſential vertue of the Animal. They were alſo much miſtaken, when they thought, that *four* Vipers, which they burn'd with *fourty* pounds of Sea-ſalt, or *Sal Gemmæ*, or *Sal Ammoniac*, (as ſome would have it) and with a great quantity of Simples, ſhould communicate great vertues to theſe Salts and theſe Coales. For in the Calcination, which they uſed to make in an earthen pot luted, with its cover on, and yet in one place pierced, the Volatil Salt of the four

four Vipers would certainly fly quickly away; and if it had ſtay'd (which yet we do not grant) and there had been half an ounce of it (which is a quantity beyond what the four greateſt Vipers could yield,) what, I pray, would that be to 40. pounds of Sea-ſalt, and to many pounds of Coales, more than a ſmall rivolet mingled with the Ocean? But as to the fixt Salt, four Vipers are not able to afford half a Scruple of it.

'Tis alſo certain, that both the Sea-ſalt and *Sal gemme*, do not periſh in the Calcination, but ſtill remain there. But if ordinary Salt Ammoniac be employed, the Urinous and Volatile part, which is in that Salt, will not fail to make its eſcape, as well as the Volatile Salt of Vipers, and there will onely remain the fixt Saline part of the Salt Ammoniac, mix't with ſome terreſtrial parts; which is that, we finde in the Diſtillation, after we have driven out all the Volatile Salt, of which afterwards, changing the veſſel and the fire, we draw an acid ſpirit, very much approaching to that, we draw out of Sea-Salt, by wayes almoſt like theſe.

Artiſts know alſo, that Herbs, Wood, Horns,

Horns, Bones, and other ſuch like matters, if they ſhould be calcined in an earthen pot, luted and covered, though a hole were left in the cover, would alwayes be afterwards found in the form of very black coales, although they had endured a great fire; and that the Salt cannot be ſeparated from them, unleſs they be calcin'd again in an open veſſel; or they being reduced to aſhes, the Salt be then ſever'd from them by a Lixivium, and by Filtration.

On which occaſion we relate an Example of an imperfect Calcination, which is naturally made in the Earth about the Summer-Solſtice, of the end of the root of many Plants, and among others, of *Mugwort* and *Plantain*; on which end, the ſubterraneous Fire, or, if you will, the Fire of the Sun, working, and yet being ſurrounded by the Earth, (which is to the root what the earthen pot, luted, is to the Vipers, and to the Mixts, that were ſhut up with them) burns it and reduces it to coales, but cannot turn it to aſhes. I have often found this to be true, and lighted upon a little coal at the end of the root of thoſe Plants, at the time above-mentioned.

So that, although the Fixt Salt of the added

ded be Simples in the Coales, yet it would have been more proper, and more methodical, to have quite calcined thoſe coales to reduce them to aſhes, and ſo to draw from them and to purify the Salt for uſe, than to make people ſwallow the groſs, earthy, and uſeleſs part of theſe coales.

Thoſe Antients added to this pretended Salt calcin'd, the powder of many Alexiterial Druggs, which not being deveſted of their vertue by any calcination, may communicate, and even alone furniſh the greateſt part of the good qualities, by them aſcribed to this Salt. And 'tis upon the account of theſe principally, that the name of *Theriacal* may belong to it, which impertinently would be attributed to the Vipers, ſince they have loſt their prime vertue in the Calcination.

This Preparation of *Theriacal* Salt doth ſufficiently ſhew us, that the Antients did not take pains to know the inward parts, of which mix't bodies are compounded, and that they did not well know the nature of the poyſon of Vipers, of which they imagin'd they ſhould be infected by the fumes proceeding from their Calcination; although none could come from them,

them, when there was none, as we have made appear. And although the ſmell, as well of the Vipers, as of the Simples, were troubleſome, whilſt they burned, yet they were not therefore at all venomous.

The little knowledge, which the Antients had, and many Moderns ſtill have, of the nature of the two Salts in Vipers, hath led them into a great fault, viz. to calcine the bones of Vipers, to draw from thence, as they thought, the true Salt of Vipers, which they were not at all like to finde, after they had diſſipated it by Calcination. The firſt fault hath drawn after it a ſecond; for the ſmall quantity of *fix't* Salt, they found in them, not much ſatisfying them, carried thoſe, that had no great ſenſe of honour or conſcience, to a very great abuſe, which was, to mix among thoſe calcin'd bones a great quantity of Sea-ſalt, to diſſolve this Salt, and and to boyle all together in water, to filter and coagulate it, and to ſell at a great rate this Counterfeit ſalt for true Salt of Vipers.

But, to accommodate ourſelves to thoſe, who, intending better, will make

no

no ill use of it; and to furnish them with a pleasing Salt for those, that may desire it for ordinary use; we shall here deliver the way of preparing a Salt of Viper, that shall have much vertue; the method of which shall be very easy, and the use very convenient.

Take three dozen of great Vipers, well chosen; cut off their heads and tails, flea them, and empty the bodies of all their entrals, and wash them well, together with the Heart and Liver: Boyl all together in ten pints of common water, so long till all be perfectly boyled. Then strain it, and squeese well all the parts; and in this decoction dissolve four pounds of Sea-salt; and carefully filter it; afterwards, coagulate, or, if you will, chrystallize this Salt, which will be found white and abounding with the vertue of the Vipers, and of no ill taste at all; which you may use in all things as common Salt.

And to shew, that these boyled and squeesed parts have left much of their vertue in the Decoction, and yet that they have not left all, and that still there remains some of it, principally in the Bones; lay them abroad, and dry them, and then distil

diſtill them, and you will draw from them, eſpecially from the Bones, a Volatile Salt and oyl, but in much leſs quantity, then if they had not been boyld.

If you would have a Viper-Salt of more vertue, and that might even be call'd *Theriacal*, you muſt proceed after the ſame manner, as hath been lately ſet down; but in ſtead of Seal-Salt, take a like quantity of Salt, drawn from *Alexiterial* and *Theriacal* Plants, as the roots of *Valerian*, *Imperatoria*, *Angelica*, *Leaves* of *Scordium*, the little *Centaurium*, *Carduus Benedictus*, and the like. 'Tis true, that this Salt is a little more diſpleaſing to the taſte than the former, but it may produce more conſiderable effects, and be uſed in extraordinary occaſions.

Theſe ſorts of Salt have indeed good vertue, and are convenient for laſting, eſpecially the two firſt: But the Volatile Salt hath ſomething more particular, and conſiderably better: the properties of it are innumerable, and it is an *Epitome* of the excellent qualities, contained in Vipers. We ſhall now ſpeak of its Preparation, as alſo of the Phlegm, of what is called volatile Spirit and Oyle, which accompany it;

it; and of the *Fixt* Salt, which remains after distillation, mixed among the terrestrial parts; and that done, we shall treat of their vertues and usefulness.

CHAP. VI.

Of the Volatile Salt of Vipers, and the Fixt Salt, and other parts, which are separated by Distillation.

WE make here publick our Preparation of the *Volatile* Salt of Vipers, with the more frankness and chearfulness, because we esteem it one of the best Medicines in Physick. 'Tis true indeed, that some Authors have already spoken of it; but there is none, that hath described it with more exactness, than we

we, nor that hath more desired, that every one might, according to this Method, obtain for himself and his occasions a remedy, which goes beyond many others, to say no more. We hope, that our way of proceeding will be well received by all, and that, if there be any that shall finde fault with it, they will be such only, who are unwilling to communicate what they have, and often wrap it up under the name of *Secrets*.

Take onely the Bodies, Hearts and Livers of Vipers, or, (to have the more benefit of all) add to them the Heads, Tails, and skins, and generally all the parts of a Viper; of which you will have a care to take away all the Excrements and Worms, as also the Eggs, that may be in the *Matrix* of the Females. Small and great, Males and Females are of the same goodness, as also the Salt is, that shall have been drawn from all the parts of the Body. Dry in the shade all these parts separately, then cut them into bits, and fill with them your Glass-limbec up to the neck, which is to be well luted. Put it in the midst of a Reverberating furnace, proportion'd to its bigness, cover it with its

head, and ſhut the Regiſter of it; Fit to the Limbec a Glaſs-recipient, which muſt be very large; and lute well all the joynts. Then begin to give a ſmall fire, which continue for about two hours, ſo that the Limbec be heated gradually, and the Phlegme begin to diſtil into the Recipient. Afterwards increaſe the fire gently unto a ſecond degree; and give a little opening at the Regiſter, and continue the ſame fire likewiſe two hours; then increaſe it, opening the Regiſter yet more, and ſo continue two other hours; at the end of which you are to give it the fire of the laſt degree, quite opening the Regiſter, and you muſt continue to drive the fire, till no more come out of the Limbec, and the Recipient be all obſcured by the Volatile Salt, which will ſtick to its ſides, towards the bottom, and to the upper part. Then let the veſſells cool, and the Furnace alſo; after which you are to un-lute the Recipient, wherein you will finde the Phlegme, that part which is called Spirit, the Volatile Salt, and the Oyle mingled together; except a part of the Volatile Salt, that may yet adhere to the upper part, and to the ſides of the Recipient, which you may dexterouſly

terouſly take away, and, if you will, keep for uſe, as 'tis. This Volatile Salt, Spirit, and Oyle, are ſo penetrating, that you are not able to hold your noſe over it.

Powre out, what you find in the Recipient, into a Gloſs-Body, which muſt be large, tall, broad below, and whoſe figure goes up ſtraightning towards the orifice; to which you muſt adapt a Glaſs-head, that is to have ſomewhat a high body, and large, and a very ſtraight mouth, and proportioned to that of the Glaſs-body. Lute the joynts exactly with paper and ſtarch; put the Body in a Sand-bath, and ſink it down as low as the matter reacheth; fit a ſmall Recipient to the beak of the Head, and lute that alſo: kindle under it a very gentle fire, and order it ſo, that the Sand and the Glaſs-body may be heated gently; after which you may increaſe it a little, but onely ſo as to make it ſtrong enough to drive up the Volatile Salt; which, being diſ-engag'd from the parts of the Vipers bodies, riſeth eaſily. It will be ſublimed, and ſtick every where to the inſide of the Head, like a Chryſtallized Snow. There will ariſe at the ſame time a little of the Spirit, which is properly nothing

but a portion of the Volatile Salt, having carried up with it a little of the Phlegme, that will run into the little Recipient, and of which even a part will congeal into Chrystals. You must alwayes be careful in managing the Fire; for how little soever you increase it, the Phlegme will rise with some of the Oyle, and they will dissolve and hide the Salt; and then you must recommence the Rectification; but governing the fire well, when you shall see the Head well lined with Salt, which will be very white and very Chrystalline, you must then un-lute it, and take it off, and lute on an other head, instead of the former. You are to take out the Salt, as soon and as well as you can; and to enclose it in a strong bottle, with such a mouth, that the Salt may pass through it, and which may be exactly closed, without which the Salt will easily fly away. Mean time, you are to continue a like fire under the Glass-body, and when no more of that Volatile riseth, you are to desist, and to take out of the head the Salt there gathered, and keep it as the former. Your Sand being cold, take off the Glass-body, and decant from it the remainder through a great Glass-

Glaſs-funnel, covered with paper for filtration, held over ſome veſſell. All the Phlegm will paſs thorough the Paper; but you'l finde ſome Oyle there, that cannot paſs, which you may make run through the Funnel into a bottle, having pierced the paper with ſome convenient inſtrument.

Thoſe that ſhall deſire a high and much more perfect Rectification of this Volatile Salt, may make it in manner following. Take two pounds of Ivory calcin'd to whiteneſs, and reduced to a fine powder; which is to be mixt with four ounces of this Salt. Then put all into a new Glaſs-Body, of the ſame ſhape with the former. To this let there be adapted and luted a blind Head, or ſuch an one, the extremity of whoſe beak is well ſtopp'd (for *that* is uſeleſs for this purpoſe, there being no phlegme; and if there were, the calcin'd Ivory being a dry Body, and in part ſpungy, would lick and retain it, as it would alſo the Oily part, that might happen to be among the Volatile Salt:) let there be given to this Glaſs-body a moderate Fire, with the ſame cautions as before; the Salt will quickly riſe, and ſtick to the Head;

where, the Sublimation being ended, you will finde it in the form of Chrystals, white like snow; which you are to put up and keep in a bottle exactly closed, to use it upon occasion. This Salt thus rectified smells not of Fire, and hath nothing but its own natural strong and penetrating scent.

There may perhaps be found Artists, who will take it ill, that we have been so large and so particular in exactly setting down all the things, that are to be observed in preparing and rectifying this Salt. But it is not for them, that we have done it, but for those, who not knowing it will be glad to learn it. We have given them sincerely the true means used by ourselves; which they may also practise in preparing and rectifying the Salts of the parts of all Animals. Those that have any tincture of Chymistry, will here find enough to teach themselves; as we have done, and do daily. Mean time they must not be offended, that there remain with us upon this subject such things, which could not be said, nor well comprehended but by those that have labour'd a great while in this Art. Intelligent persons, that

shall

ſhall examine our proceeding, or have a mind to experience the ſame, will find our ingenuouſneſs, by finding the ſucceſs of all we have made them expect, together with the facility, we give, of the Operation. They will alſo find, that our way of filling the Retort as far as the neck, is more proper than that of leaving a third part empty, as ſome would have it, in the Diſtillation of the Bones, Horns, and other dry parts of Animals; although thoſe, that underſtand it, practice it not but in matters that will melt, and may break the Retort, or let ſomething run out by the beak, when 'tis fill'd too high. But in dry ſubſtances, as are our Vipers, and the Horns, and Bones of Animals, Crabs-eyes, Stones, and the like, it is enough to leave this neck empty, to give vent to the parts raiſed from the matter, and that are to go into the Recipient. They will alſo acknowledge, that our way to leave the Oyl among the other ſubſtances, when we will ſever them by ſubliming and rectifying them, is not without reaſon, in regard that the Oyl hath commonly with it much Volatile Salt, which leaves it, and afterward riſeth in the Rectification.

We

We esteem also, that this Preparation will be preferr'd before many others, that are operose and have little method in them; and, among others, before the Rectification, which some pretend to make by the addition of Spirit of Salt to the Phlegme, and to that which is call'd Spirit, and to the Volatil Salt: which instead of rectifying this Salt, and of making it purer and better, changes its nature; and instead of subliming it to the Head and the top of the Body (as they have pretended it did, after the Phlegm was risen) the Spirit of Salt riseth it self in its first form, in its smell, colour and taste, leaving at the bottom the Salt, which is there found like fixed, having the tast and the other qualities of the Spirit of Salt, but being lessen'd of two thirds of its weight. That kind of men have fill'd Books with many Preparations they understand not, nor have experimented: For, forgetting, among other things, in the process of this, such methods as are absolutely necessary, and without which they do nothing, they promise impossible successes, and putting the Cart before the Horses, they fix the Salt when they pretend to sublime it, and

so

ſo very unadviſedly proſtitute themſelves to ſhame and confuſion. For, inſtead of rectifying firſt the Volatile Salt (as more intelligent men might have taught them, of whom they had borrowed this Preparation) and of ſubliming it, and of ſeparating it by this means from other parts; they labouring to diſguiſe the Proceſs, have retrenched the main and moſt neceſſary part of it, and employed at the very firſt that method, which they ſhould have obſerv'd to fix it, believing that that would ſublime it; not conſidering, that having by that means inverted nature, the ſucceſs would prove anſwerable to it. I ſet a ſide their unwarrantable practice of adding a pound of luke-warm water among the ſubſtances found in the Recipient, after the firſt diſtillation, ſince it is an Augmentation, not onely uſeleſs, but troubleſome, of that Phlegme, which muſt needs be ſeparated.

Now, although one part of this Salt, remaining in the Body of the Limbec, may yet afterwards becom Volatil, by mixing it with ſome Lixiviat Salt, and making it to ſublime; yet *that* is not done but with a new and very great loſs of its weight; nor

nor is the taſte of it better than of that, which ſhall have been well rectified according to the method, we have before deſcribed; ſince the Lixiviat Salts, by reviving it in part, give it as diſpleaſing a ſmel as the former. We may further add here, that the uſe of tall and ſtrait-neck't Bodies is much more proper for this Rectification, than the uſe of Matraſſes with long necks, myſelf having experimented, that the Phlegme fals back again more eaſily, and that the Volatil Salt riſeth purer in the Bodies of our faſhion; of which the *Figure* may be ſeen on the *Title page*, where alſo is that of the Retort and the Recipient, for the firſt Diſtillation.

Now although the ſame men, that have given us cauſe to reprehend them, have affirmed contrary to truth, that there is no *fix't* Salt in the parts of Animals: To prove that there is, and to benefit by that of the Viper; Take what ſhall remain in the Retort, commonly called the *Caput Mortuum*, which you will find of the form and colour of Coales; calcine it in a Furnace, or, to ſave expences, in a Potters Oven, till all become white and of the form of Chalk, pulverize it well

well, and make it boyl in a competent quantity of water, that may receive and diſſolve the Salt; filter it, and make it euaporate and conſume. You'l find at the bottom a coagulated Salt; though in a ſmall quantity, and ſuch an one, as that of five pounds of Viper-bones well calcin'd, we have obtain'd no more than three ounces of fix't Salt. This Salt hath a very ſharp and poynant taſte; it is Lixiviat, and approaching enough in divers regards to the fixt Salt of Tartar. You'l find on the Filter the Terreſtrial part, ſtripp'd of all its vertue; which then may juſtly be call'd *Caput Mortuum*. And thus you'l have the Phlegme, that which is call'd Spirit, the Volatil Salt, the Oyl, the Fixt Salt, and the Earth; into which all the parts of the Viper have been reduced in their ſeparation.

CHAP. VII.

CHAP. VII.

Of the Fixation of the Volatil Salt of Vipers.

ALthough the Volatile Salt of Vipers have in it, to ſpeak truth, nothing offenſive, but its ſtrong and piercing Smell, and that thoſe, who ſhall take into their mouth the weight of a good number of grains; cannot receive from it any other trouble but that of this Sent, which yet ſoon paſſeth away, this Salt leaving afterwards a ſaline and very agreeable taſte; yet notwithſtanding many perſons, offended with the piercing odour, which is firſt perceived in this Salt, and beſides diſſatisfied with its eaſy Avolation, unleſs it be extreamely well cloſed, have endeavoured to fix it, and ſo to free it from this ſmel, not conſidering that this ſmel cannot be altogether ſeparated from this Salt, but its vertue muſt be ſo too, and that the fixation changes its nature: And inſtead of contenting

ting themſelves to rectify it well, thereby to carry away, as much as may be, the adventitious ſmel, which it may have acquired by the violence of the fire by the firſt diſtillation, they have ſometimes altogether deſtroyed it, and have dealt with it, as if one would deprive *Muſc* and *Amber-gris* of their good ſent, and *Coloquintida* of its bitterneſs; and many compounds of their operations, which would not be what they are, if you ſhould robb them of the leaſt of thoſe parts that compoſe them.

We ſay therefore, that after the Rectification of this Volatil Salt, (ſuch an one as we ſhall ſet down beneath,) the beſt and ſureſt preparation would be, to do nothing elſe to it, but to make it to be uſed in that condition, only mixing with it things accomodated to the Patients taſte, or with ſuch other remedies, as do not change its nature, nor make it looſe any thing of its force or vertue.

If the Fixed Salt of Vipers were capable to arreſt and retain the Volatil, there were then nothing to be ſaid againſt this fixation, becauſe having been both formed jointly and in the ſame body, they have

have no averſion to, but rather are able to help one another; But this common origin, and this friendſhip which they have contracted, whilſt they lived together in one and the ſame ſubject, hinders them from deſtroying one another, and maketh, that what is Fixe can nor will change the nature of the Volatil. And indeed, although you mixe them together, and that the quantity of the Fixe be five or ſix times greater than that of the Volatil, and that they may alſo lodg with one another; yet they both equally keep their nature and vertue, and they may be ſeparated by fire, and manifeſt at all times their ſeveral and diſtinct vertues. But this hinders not the taking one Salt among the other, nor that the Fixe ſhould not then borrow ſomewhat of the ſubtilty of the Volatil; the better to penetrate the Entrals and Veſſels; to open the more vigorouſly the obſtructions, and to expel the impurities, it meets with, by ſiege or urine; and that, on the contrary, the Volatil Salt, helped by the Fix't Salt, ſhould not carry away and drive out through the pores of the skin or other ways, the more groſs and more viſcous parts of the humors, that perhaps might have

have escaped its quick and subtile operation: For which uses, both Salts may be mix'd together upon occasion, without undertaking an impossible fixation.

But especially, the fixing of this Volatil Salt by *Quick-lime* cannot pass with all Artists but for an operation altogether destructive to it; and 'tis that, which is most of all to be avoided, because not only it carries away the smel, taste, and vertues of this Salt, but quite changeth its nature, and converts it into its own, by petrifying the same.

The Fixation of this Volatil Salt, by the Spirit of Salt, although it seem to destroy it and change its nature, in that it carries away the smel and taste of the Volatil Salt, may notwitstanding be admitted rather than the other, in regard that the Spirit of Salt, by preserving the vertue it hath to open all the obstructions of the inward parts, working upon the Volatil Salt, may appropriate to it self something of its vertue, especially that which is able to second its action, and to expel together with it, by urine or other ways, the most tenacious and most stubborn humors. Those that would expel the humors

mors by these ways, may usefully prepare it after this manner.

Mix four ounces of the Volatil Salt of Vipers, well rectified, with four ounces of Water; put them into a Glass-Cucurbite somewhat high, of a narrow mouth, broad and flat towards the bottom, holding about two pints. Fit to its mouth a Glass-funnel, the end of whose pipe is very narrow: Lute the funnel quite round about the orifice of the Cucurbite, so that there may be no other aperture but that of the end of the funnel. Then powre, little by little, and drop-wise, some Spirit of Salt well rectified upon the Volatil Salt. At first there will be a conflict betwixt them, which will cause an ebullition, but that of a short duration. Continue to powre upon it of the same Spirit of Salt, gently and leisurely, according as you find the ebullition cease, and by intervals stir also the Cucurbite; and repeat this so often, that at last there appear no motion any more, and the Spirit of Salt have as 'twere mortified and fixed the Volatil Salt. Then place the Cucurbite in some receptacle furnisht with Sand; fit to it a head, lute it (though at the

the beginning that be not neceſſary) and by a ſlow fire draw away all the moiſture of the Spirit of Salt, and of the Volatil Salt, which will riſe almoſt inſipid. Continue the fire ſtill, and when you ſhall perceive a taſte of the Spirit of Salt in what ſhall be diſtill'd, change the Recipient, increaſe a little the fire, and drive it (yet without too much violence,) until there diſtil no more, and that the Salt remain at the bottom of the Cucurbite altogether dry and of a gray colour. You'l find in the Recipient a Spirit of Salt of the ſame taſte, of the ſame colour, and of the ſame force it had when it was powr'd upon the Volatil Salt; but you ſhall not find any part of the Volatil Salt riſen to the head, nor to the top of the Cucurbit, as ſome have given out it doth, without having experimented it, as we have done. The gray Salt, found at the bottom, is but in a ſmal quantity, being leſſen'd almoſt of two thirds: It's taſte is very ſharp, biting, and much differing from what it had before it was fix'd, and as 'twere mortified by the Spirit of Salt. After this you may diſſolve this Salt in water, filter it, and make it evaporate, and letting it cool,

you'l find at the bottom a ſmal quantity of Salt coagulated in the form of Chryſtals. Powr out by inclination the water ſwimming on the top, to have the Salt by itſelf, which you may dry in the Air, or the Sun, or over a little fire. You may alſo make good uſe of the Salt that ſhall have remained in the water that ſwam a top, by making it evaporate in part, Chryſtallizing and drying it, as the former. You might, if you pleaſed, very well omit luting the Funnel upon the Cucurbit, when you will powre the Spirit of Salt upon the Volatil Salt; foraſmuch as we have found by experiment, that in the operation of the Spirit of Salt upon the Volatil Salt, there riſeth nothing but phlegme, that hath neither vertue nor ſmel; although the ſame perſons, that have err'd in many things in the rectification of the Volatil Salt, have fear'd they ſhould looſe therein a Volatil Spirit, which was only in their imagination: And the luting, which we have adviſed, was only to prevent peoples belief, that a part of the Volatil Salt might have eſcaped that way.

But although this Volatil Salt appear fix't, and remain as ſuch at the bottom of the

the Cucurbit, after distillation, yet there is a part, which retakes its former nature, and becoms Volatil again, if it be mix'd with *Salt of Tartar*, or with some other Lixiviate *Salt*, putting them together in a subliming vessel. For these *Lixiviate Salts*, being of a nature contrary to *acid Salts* and *Spirits*, do mortify them and retain them to themselves, and let go the Volatil *Salts*, which the acid spirits had, as 'twere, mortified and fix'd, and all that was Volatil in this seemingly fix't *Salt*, riseth in a white form, and hath almost the same taste and the same other qualities of the Volatil *Salts* well rectified. Yet you will also find there a great diminution of its weight, so that it will be more advantagious to keep it in the condition, it was in before this last sublimation; the greatest advantage of which is, to come to know, that the fixation, that hath been made by the Spirit of Salt, although it have as 'twere changed the nature of the Volatil Salt, and hid its diaphoretique quality under that of the diuretique, yet hath not quite destroyed it, since there is some part, that can retake its pristine form and vertue.

This Salt thus fix'd poſſeſſeth the vertues of a Spirit of Salt concentred, but they are found augmented by thoſe, it hath borrowed from the Volatil Salt. Thoſe, who wou'd only carry away, by urine or ſiege, the ſuperfluous humours of the body, may uſefully prepare and employ it; but thoſe, that ſhall uſe the Volatile Salt well rectified, without changing its nature, nor diverting its action by any fixation, will finde therein ſuch effects, as will be incomparably more apparent and more ſenſible, and will not waſte of it ſo much.

CHAP.

CHAPT. VIII.

Of the Vertues of the Volatile Salt of Vipers, and of what the other parts, ſeparated by Diſtilla on, may perform.

THE Volatile Salt of Vipers is to be conſider'd, as a Sun, as well among the parts, that riſe by diſtillation, as among thoſe that reſt in the Retort; there being none among thoſe that are come over, but have borrowed from it almoſt all the vertue it can have; nor any of thoſe that have ſtay'd, but have need of it, or are uſeleſs without it. The *Flegm* that riſeth firſt, carries alwayes ſome part with it, without which it would produce no effect. That which is called *Spirit*, is nothing elſe, to ſpeak aright, but a Volatile Salt, which in the diſtillation

hath been followed by a little Flegme diſſolving it, and giving it the form of a Spirit: which may be ſhewed by the Rectification, wherein that ſaline volatil part is ſeparated, raiſed, and coagulated into a white and chryſtalline forme, and leaveth at the botom of the cucurbite the moiſture that had changed its nature, and is nothing elſe but flegm. We ſay, on this occaſion, the ſame thing of what many Authors improperly call the Volatil Spirit of an humane skull, of Harts-horn, and of other parts of Animals, they being nothing elſe but Volatil Salts mixt with flegme, which they afterwards quit, when they are rectified. The *Oyle* alſo would have but very little vertue, if it borrowed no Volatil ſalt, and if it retained not in it a good part thereof, as may be obſerved in the Rectification: for, if the Oyle were meaſur'd, or weighed, before 'tis put among the reſt into the cucurbite for rectification, and if it were weighed again after that all the Volatil Salt is riſen, it would be found much diminiſhed in quantity, and in ſtrength alſo, becauſe moſt of the Volatil Salt, which had joyned it ſelf to it, hath been carried away by the rectification.

tion. So thoſe, that ſeparate the Oyle from the other parts to rectify them, and who uſe it not but for wounds or ulcers, and to take away ſuperfluities, do doubtleſs not know it aright; for it is alſo endow'd with other vertues more conſiderable; of which we ſhall ſpeake in this *Chapter*. The Fixt Salt, which reſts in the Retort, mix't among the terreſtrial part, although it is to be put in the rank of Lixiviat Salts, and poſſeſſeth few other qualities, but thoſe of Salt of *Tartar*, yet retains ſomething of the nature of the Volatile ſalt. And thoſe, that have conſidered this Salt as a *Cauſtick*, have had good ſucceſs with it, without knowing its nature, ſeing they imputed it to the maligne parts, which they believed to be in Vipers, whereas they ſhould have aſcribed it to the nature of Lixiviate ſalts. But this Salt being taken at the mouth, will be much more effectual, if you mingle ſome Volatil Salt with it; this Cauſtique faculty not hindring but that it may be taken ſafely and beneficially in appropriated liquors, as many other lixiviate Salts are.

The *Terreſtrial* part hath nothing in it, that deſerves to be conſidered, and it may

Juſtly be called *Terra mortua*, Dead earth, after it is freed from its fixed Salt. So that all the parts, that riſe by diſtillation, as well as thoſe that cannot riſe, are of ſmall force, or altogether uſeleſs, without the Volatil Salt. It is therefore upon good reaſon, that we attribute to it the principal vertues, which a Viper can furniſh.

The ſimilitude of ſubſtance, which the Volatile Salt of Viper hath with the ſpirituous parts of our Body, conjoyn'd to its ſubtile and piercing quality, maketh, that accommodating itſelf to their condition, and finding all liberty in its actions, it produceth all the effects, it is capable of, and penetrateth without any oppoſition into the moſt ſecret and the moſt remote parts of the Body. It hath this peculiar, that though it act as a Soverain, and finde nothing of reſiſtance to its dominion, yet it exerciſeth it not as a Conquerour, nor as a Deſtroyer, but rather as a Reſtorer of the places and parts, where it paſſeth; and although all its courſes be extraordinary quick and precipitate, yet they are ſo well [illegible]ed and ſo well directed, that no part [illegible]ody miſſeth them, and that none [illegible]ſeth is unuſeful, but rather very beneficial

neficial to all the places, where it paſſeth.

Now ſince the fleſh, the heart, the liver, and the other parts of the Viper, taken as an Aliment, or as a Medicine, may ſerve for the cure of many maladies, and produce very conſiderable effects; 'tis not at all to be doubted, but that this Salt, which is the moſt ſubtile and the moſt potent of them all, is ſomething more ſublime and more efficacious. And we are aſſur'd, that if it were well known to us, it would paſs for an almoſt Univerſal medicine; men would be careful of preparing it, and we ſhould ſee it often preſcribed by Phyſitians, and find it ſucceed in innumerable obſtinate diſeaſes, that are but ſeldom and difficultly cured.

To Judge well of the Effects, which this Volatile Salt can produce in our Bodies, we muſt know its manner of operation, which is, to open, to comminute, to attenuate, to pierce, and to drive to the extreme parts of the Body, and through the pores of the skin, all the impurities, and all the ſtrange bodies, that can get out by thoſe wayes. Further, it is an enemy to all corruption, very friendly and very agreable

able to our nature, which it assists and fortifies, enabling it to expell, not onely by the pores of the skin, but also by siege and urine, and by all the Emunctories of the Body, the superfluous humors, which molest it: Whence it comes to pass, that it produces admirable effects upon a thousand occasions, curing a great number of sicknesses, or at least giving great relief therein, even in those, that are most refractory, and most difficult to cure; such as are Apoplexies, Lethargies, Convulsions, Palsies, and many other maladies, believed to have their source in the Brain. It is also a great relief to the Distempers of the Breast, as Swoundings, Palpitations of the Heart, Difficulties of Breathing, and Pleurisies. Besides it particularly unstops the Obstructions of the Liver, Spleen, Mesentery, and other parts of the lower Belly. It dissipates all inward impostumes, in their rise, and dislodgeth secret and unknown pains, which have their origin in the Spirits. It helps digestion, the purification of the mass of the blood, and its distribution to all the parts of the Body, and resolves and prevents coagulations: And so being an Enemy to all corruption, it is very proper

for

for all ſorts of Fevers, cauſed thereby; as for moſt intermittent Feavers, and particularly *Quartans*. It alſo worketh powerfully in the diſtempers of the *Matrix*; and is a remedy to all the vices of the skin, and to the Leproſy it ſelf: but above all, 'tis ſpecifique againſt all Bitings and ſtingings of venomous creatures, againſt all venoms and poyſons, if they be not corroſives; for in that caſe, recourſe muſt preſently be had to Vomitives and to Unctuous things, after which it produceth good effects. It hath a particular vertue againſt the Plague, againſt all Contagious diſeaſes, and Epidemical ones, ſuch as are the Meaſels, Small Pox, and the like. In a word, the Inductions, we can draw from the great number of Experiments, we have ſeen of it, at different times, oblige us to affirm, that its vertues goes beyond what can be expreſſed. And thoſe, that ſhall make reflexion on what we have ſaid of it, will be able to apply and uſe it beneficially to many other ſickneſſes, which to enumerate would be too prolix and too tedious.

In the mean time, we cannot forbear to relate here a very remarkable Experiment, made upon a Gentleman, who ſuffered about

about a month ſince, a violent and continual paine, doubled and redoubled, at the right part of his front pretty near the Temple: the end of a finger might cover the place of the pain; there appeared no redneſs nor ſwelling, and there was perceived no hardneſs. Yet the pain, though it was, as 'twere, fixed in a point, was communicated to the other neighboring parts, ſo that the Gentleman could not chew, nor ſo much as open his mouth to take down a little broth, but with extreme pain, though hunger urged him. The Phyſitians, that ſaw him, had uſed ſeveral means to relieve him, and, among the reſt, *Venæ*-ſections in the arm and foot; they had purged him often; they had employed frictions of his neck and ſhoulders; they had applyed to him Veſicatories, and Snailes, behind his eares: they had cauſed his temporal artery to be open'd, and drawn from him ten or twelve ounces of arterial blood, and then cauteriſed the Aperture; they had alſo preſcribed him powerful Sudorifiques, which were continued many dayes morning and evening, and had made him ſweat very copiouſly; and the Patient himſelf, of his own accord, being extremely preſ-

ſed

ſed by the violence of the pains, cauſed one of his upper teeth, which was very ſound, to be pulled out, hoping thereby to give ſome vent to them: But after he had uſed all theſe means in vain, one doſe of the Volatil Salt of Vipers, given in wine, remov'd preſently all the pain, which cauſed as great a wonder in the Aſſiſtants, as ſatisfaction in the Patient. This ſo ſurpriſing effect, which demonſtrateth better, than all reaſons, the force and efficacy of this Volatil Salt, may alſo conclude the diſcourſe of its Vertues.

There remains now, that we ſay ſomething of the vertues of the *Oyle*, which riſeth by Diſtillation with the Volatil *S*alt, of which it alſo retains a part. Its ſtrong ſent is the cauſe, that it is not often employed; whence it comes, that ſometimes it is more advantageous to the Preparer, to profit by the rectification of the Volatil *S*alt, which it hath, than to keep it in its condition for Patients that ſhall uſe it notwithſtanding its ſtrong ſmel and ill taſte. This ſmel is ſo intimately ſticking to it, that there is no rectification, able to remove it. But we make herewith known to all thoſe, that ſhall be able to com-

comply with the uſe of it, that it is one of the beſt and moſt efficacious outward remedies in all Phyſick, provided it be made uſe of, when 'tis yet indued with its Volatil Salt: For it opens, attenuates, reſolves, is abſterſive, and admirably cleanſing; and we know, who have experimented it, that the continued anointing with it, accompanied with the internal uſe of the Volatil Salt, produceth admirable effects in the parts labouring under the Palſy, and deprived of motion, and even in thoſe, that are dryed for want of the communication of Spirits and nouriſhment. A little Spunge imbibed with this Oyl, carried in a little box pierced, and often ſmelled to, is very good in the time of the Plague, to keep off the ill Air, and to fortify the Brain, and the noble parts. It is alſo good to make it to be ſmelled, to put of it in the noſtrils, and to annoint the Temples with it, in Epileptical Symptoms, and for thoſe, that are troubled with giddineſs, and have their Brain charged with vapors or flegme; for it gives them vent, and diſpels them powerfully. It hath alſo a conſiderable effect againſt the ſuffocations of the *Matrix*,

trix, and againſt all ſorts of worms; in which caſe, ſome drops of it may even be given at the mouth, in wine, or broth; and the hollow of the ſtomach anointed therewith. It viſibly diſſipitateth all outward contuſions, and ſerveth much for inward ones, and eſpecially for thoſe of the Head. It reſolves tumours and hardneſſes, giving iſſue by the pores to ſuch matter, as can tranſpire, digeſting the groſſer, and bringing them to a laudable ſuppuration. It is alſo abſterſive and cleanſeth all ſorts of Ulcers, and healeth all the diſtempers of the skin, even the moſt ſtubborn, provided the internal cauſe thereof be removed. In all which evils its effects are yet more quick and powerful, if it be enforced by the internal uſe of the Volatil Salt, which, in a word, is that, which gives it its main vertue.

We ſhall add, on this occaſion, that the Ancients valued very much their Oyl of Vipers, which they prepared ſeveral ways, ſome by infuſion, ſome by the decoction of Vipers in Oyl of Oliues. If they had rightly proportioned the quantity of Vipers with that of the Oyl; it they had added thereto what moiſture was neceſſary; and

if

if in this they had employed ſome good method, this Oyl might produce good effects, and we ſhould approve of it, and refer our Readers to it. But finding nothing regular in all the Preparations, by them deſcribed, we thought good here to ſet down one, according to all the rules of Art.

Take about the end of *May*, or the beginning of *June*, a dozen great Vipers newly taken, cut each of them into ſeven or eight pieces, and put them into a well glazed and ſtrong earthen pot: powr upon them three pounds of Oyl of Olives, and one pint of white wine; cover the pot well, and make it boyl over a gentle fire to the conſumption of the moiſture. Then ſtrain all, ſqueeze out the Vipers well, and keep the Oyle for uſe. In the mean time, fear not (as the Antients did) the Vapors, that may iſſue out of the pot during the decoction; for the Vipers, as we have ſaid, have no poyſon in all their body. This Oyle, thus prepared, hath not, 'tis true, all the ſtrength and vertues of the diſtilled Oyle, of which we were ſpeaking a little before; but it may very well ſerve for an oyntment in all the diſtempers

ſtempers of the skin, in contractions of nerves, in rheumatiſmes, & in many other evils.

CHAP. IX.

Of the Manner of uſing the Volatil Salt.

ALthough it be impoſſible to ſpecify in particular all the wayes of Uſing the Volatil Salt of Vipers, no more than one can well enumerate the ſickneſſes, that may have need of it; Yet, in ſome degree to ſatisfy thoſe that may deſire it we ſhall make here an Abridgment of a good part of what we have ſeen practiſ'd by Pyhſitians, that perfectly know the qualities and proprieties of this Salt, and uſe it daily to the great benefit of their Patients.

You muſt *firſt* know, that its piercing Taſte hinders it from being given alone, and that it muſt be mix't, *now* with ſome

Aliment, as in broth, the yolk of an egg, a roſted apple, a little jelley, &c. *ſometimes* with Medicines, and that innumerable wayes, which partly depend from the humour and diſpoſition of the Patient, but chiefly from the wit, knowledge, and diſcretion of the Phyſitian. For this Salt call's for a Phyſitian, that hath ſufficient ability to know and meaſure its force and activity; that is intelligent and verſed in all Maladies, to be able beneficially to employ it in thoſe that require it, that knows to chuſe a favorable time and occaſion; and to mix it pertinently and to good purpoſe with ſuch things, as may not change its nature nor divert its operation, nor ſubvert the indication, he ſhall have taken. So that 'tis neceſſary, to be equally aſſur'd of the genuine and methodical preparation of the Salt; of the knowledge of its qualities and vertues; of the nature of the diſtemper, of the condition, temper, and ſtrength of the Patient; of the fitneſs of its exhibition among aliments or appropriated medicaments, and of the occaſions and the time, in which it may be uſefully employed. And when a due regard hath been had to all theſe circumſtances, men

will

will not fail to finde very good effects of it. But that thoſe, who are not accuſtom'd to make uſe of it, may not unawares finde in it effects contrary to the nature of this Salt, we have thought ourſelves oblig'ed to advertiſe them, that they muſt above all things avoid mixing them among *Acids*, and eſpecially among Spirit of Salt, Vitriol, Brimſtone, and the like, which would fix it and deſtroy its operation. To find therefore facility in its exhibition, it may be taken in diſtilled waters, or ptiſane, or ſuch decoctions as are appropriated to the diſeaſe; as alſo in Juleps, Emulſions, or Potions diverſly compoſed. It may alſo be mix't in Conſerves, Extracts, Confections, and the like; as alſo in Lozenges and Opiats, diverſly made according to the nature of the diſtemper, and the intention of the Phyſitian; It is alſo mingled with Purgatives, Sudorifiques, Aperitives and Diuretiques; and no leſs, with its own fix't Salt, and ſuch other Salts, as are not contrary to it. It is alſo given in Wine, and among certain Mineral waters. It may be adminiſtred to both ſexes, and to all ages, at all times and hours, between meals according to the nature of

the diſeaſe, and the intention of the Doctor. It may be taken, if one will, ſeveral times in a day, and even at night; and the uſe of it may be continued for a good while.

As to its doſe, that is different, according to the occaſion, age, temper and humour of the Patient, and the nature of the diſtemper, and the reiteration made of it: For, the doſe is to be much leſs for thoſe, who take it often in one day, and continue the uſe of it, than for thoſe, that take it but once in a caſe of need. Sometimes 'tis eſteemed ſufficient to give 6. 8. 10. or 12. grains of it; but on certain occaſions we may give 20. or 25. grains, and ſome-times, half a drachme, and even a whole drachme. But diſcretion and skill is to be uſed; without which, this Salt, as excellent as 'tis, may produce effects quite contrary to what the Phyſitian and the Patient might expect from it.

CHAP. X.

CHAPT. X.

Divers Remedies or Compoſitions, of which the Volatil Salt of Vipers is the Baſe or Ground.

WE had not undertaken to deſcribe the vertues, nor the Uſes of the Volatil Salt of Vipers, no more than of the Fix't Salt, and of the Oyle that riſeth by Diſtillation, if this our Book were only written for the skilful Phyſitian, who perfectly knows all, and eſpecially the parts that may be drawn from the Viper. But being deſirous to do a good office to ſuch perſons, as have no knowledg thereof, or that knowing it in part, have need to be directed, eſpecially in the exhibition of this Volatil Salt; we thought good to conclude this Book with the *Receipts* of

the chief Compoſitions of which this Volatil Salt may be the Ground, which are not found in Books, and may produce Effects worthy of this Salt.

And knowing, that there are many curious perſons, who having a great eſteem for the Viper and its uſes, make preparations thereof in private, following the *Receipts* they find in Books, which ſometimes are well, ſome-times ill preſcribed, or ill executed; We ſhall impart to them an *Elixir* of *Vipers*, that ſhall be of great vertue, pleaſant to the taſte, of eaſy preparation, and of long duration.

Take four douzen of Hearts and as many Livers of Vipers, dry'd in the ſhade, and reduced to powder; two drachmes of good Cinnamon, half a drachme of Cloves, groſly beaten: put them into a ſtrong glaſs-bottle, holding about two pints. Powr on it a pound of the *Queen* of *Hungary's* Water, a pound of Meliſſe-water, half a pound of Orange-flower-water, and half a pound of Roſe-water. Cloſe the bottle exactly, and expoſe it to the Sun for fourty dayes; after which diſſolve in the liquor a pound of fine Sugar, and paſs all through a clean bagg. Put up this

this Elixir in a Bottle, and add to it half an ounce of the Volatil Salt of Vipers, well rectified, twelve grains of Levant-Musk, and as much of Amber-gris. Close the bottle exactly, and you may keep this *Elixir*, to use it in time of need, from half a spoonfull to a whole. You may take of it in the morning upon an empty Stomack, and at all hours, according as necessity shall require. This medicin is very good and very convenient: It is not onely proper against all Poysons, against the Plague, and all Contagious and Epidemical diseases, but it also fortifieth all the noble parts, preserves the Natural heat in good condition, and by this means the use of it conduces much to preserve Health, and to prolong Life.

The *Elixir* following deserveth also to be communicated to the Public, as a medicine that is not common, and is very available, not onely for the Sickness of men, as well in the Brain, as the stomack, and all the noble parts; but also very particularly, for most of the diseases of Women. I shall give you here the Description of it. Take an ounce of good Saffron, as much of fair Myrrhe, as much of *A-*

loes Socotrina, and the ſame quantity of White Amber; a drachm of the Extract of *Opium*, and as much of the Extract of *Caſtor*. Mingle your Extracts in a little Spirit of Wine; pulverize all the reſt; and put altogether in a Glaſs-Body: powr upon it three pounds of Spirit of wine tartarized; place the Body in a Bath of Aſhes; fit an Head to it, with its Recipient, well luted together: Give it a moderate fire, and draw from it about the moiety of the Spirit of Wine; then unlute your veſſels, decant the tincture, that will ſwim above your powders, which will be found very much imbued with all their qualities; and keep it by itſelf in a bottle well-cloſed. Powre the Spirit of Wine, which you have drawn off, upon the remainder in the Body; Fit again to it the Head and the Recipient, and draw again from it the half of the Spirit of Wine. Decant again the tincture ſwimming a top, mingle it with the firſt, and keep it likewiſe. Cohobate for the third time the Spirit of wine, drawn off, upon the remainder in the Body; proceed as before, and powre off the tincture ſwimming a top, and mingle it with the former: then filter all three toge-

together, and powre all into a ſtrong Viall, adding to the whole an ounce of the Volatil Salt of Vipers, which will eaſily diſſolve in it; keep the whole thus mix't and well cloſed. The *doſe* may be from ten to ſixteen drops.

We ſhall yet adde to this an *Opiate* of great efficacy for moſt diſtempers of the Brain; and tis this. Take half an ounce of the Extract of the root and ſeed of the male-Pæony; and of the true Miſſeltoe of the Oak, and of that of Betony-flowers, and of that of Clove-gilly-flowers, the ſame quantity of each of them; three drachms of the Confection of *Alkermes* of *Meſue*, three drachms of the Volatil Salt of Vipers, one drachme of the Volatil Salt of *Succinum*, two drachms and an half of prepared Pearl, and as much of Crabs-eyes prepar'd; three drops of Cinamon-oyle, and as much of the oyle of Mace: Mingle all according to Art, and make an Opiate of it, and keep it in a pot of Fayence (a ſort of fine white Earthen pots) well cloſed. The doſe of it may be from a ſcruple to a drachme.

You may alſo make, in the following manner, an opening and laxative Opiate, that

that ſhall conduce to the cure of ſundry long and ſtubborn diſeaſes, eſpecially of thoſe that are cauſed by ſeveral obſtructions of the parts. Take of the Conſerve of Tamariſk-flowers, of the Conſerve of the Flowers of *Geniſta* or Spaniſh-Broom, of that of Mary-gold, and of that of the Male-peach flowers, of each ſix drachms; half an ounce of the Volatil Salt of Vipers, as much of the Extract of the ordinary *Iris* root, and as much of the Extract of Rubarb; two drachms of the fix't Salt of Vipers, as much of the Mineral Bezoar, and as much of the Salt of Worm-wood; a drachme and an half of Roſin of Scammony, and as much of the Extract of Coloquintida; and a drachme of the powder of Cinnamon. Mix all theſe things together, and adding to it, as much as needs, of the Syrup of Succory, compounded with Rubarb, you ſhall make an Opiate of it, the Doſe of which may be from one drachme to two, and even to three for ſtronger Bodies.

There may alſo be made Pills, that ſhall have a vertue near the former in efficacy, to be taken in a leſs quantity. Take of the Extract of Aloes, made with the juyce of

of the cleanſed flowers of Violets, of the Extract of Rubarb, and of that of the Levant-Sena, of each two drachms; as much of the Volatil Salt of Vipers, as much of the Roſin of Scammony, and as much of the Gumm Ammoniac in drops; one drachme of Mineral Bezoar, and the like quantity of the Fixt Salt of Vipers. Reduce all into a maſs of Pills, of which the doſe ſhall be from half a ſcruple to two ſcruples.

Thoſe, whoſe ſtomach ſhall be troubled with tenacious humors, ſuch as could not be carryed away by Purges, or other remedies; thoſe, that have a nauſeouſneſs, and are ſubject to troubleſome reſentments from the Stomach, may to good purpoſe uſe the following powder.

Take of Coriander-ſeed (that is not prepared with Vinegar, according to the ill way of the Antients, but ſuch as is ſold in good ſhops,) of Anis-ſeed, of ſweet Fennel-ſeed, of the root of Lickoriſh well ſcraped and dryed, of each half an ounce; three drachms of the Volatil Salt of Vipers, and as much of Crabs-eyes prepared; two drachms of the Fixt Salt of Vipers, and as much of well-choſen Cinamon. Bring all

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to a fine powder, and adde to it its weight, or if you will, double its weight of fine powder'd ſugar. Cloſe this mixture in a Glaſs-veſſel, or in one of the fine white Earthen pots, and cloſe it carefully. You may take of it, at a time, from half a ſpoonfull to a whole, according as you have put more or leſs Sugar to it. You may alſo adde to the powder ſome drops of the Oyl of Anis, and of the Oyl of Cinnamon, and even of Musk and Ambre-gris.

This Volatil Salt is to very good purpoſe mix't among the Sneezing powders; for beſides that it penetrates exceedingly by its activeneſs, it alſo diſcharges the Brain powerfully, and withall fortifieth it. It may be mixed with the powders of Betony, Marjoram, Roſemary, Arabic, Stæchas, Sage, and the like, not putting but a ſixth part of our Volatil Salt among theſe powders.

Thoſe that would have an Opiate, proper not onely to fortify the Heart, the Stomach, and all the noble parts, but alſo to expell all kind of Venom, and all the impurities of the maſs of Bloud, and of the ſolid parts, and to make them iſſue out at the pores of the skin, or at the other emunctories,

ctories, may prepare very beneficially the following Opiate.

Take two ounces of the Conserve of Gilly-flowers, one ounce of the Confection of Alkermes, ambred and musked, six drachms of the Volatile Salt of Vipers well rectified, half an ounce of the Confection of Hyacinth, as much of the Electuary of *Diascordium*, three drachmes of the Mineral Bezoar; and of Pearl prepar'd, of Crabs-eyes prepared, of the Extract of Angelica, and of that of Carlina, of each of these the same quantity; two drachms of the Salt of Carduus Benedictus. Mix all together, and reduce it to an Opiate, by adding to it some Syrup of kermes, or the Clove-Gilly-flowers, as much as needs to give a good consistence to the Composition: Which you are to keep close for your occasions. You may take of it, for a preservative, half a drachm, at a time, in Wine, or broth; but in urging sicknesses, you may take of it a whole drachme, and even two drachms.

Those that will use the Oyl which hath been drawn by Distillation, may either employ it all alone, or mingle it with an equal quantity of *Unguentum Martiatum*, and

even

even adde to it Oyles distilled of Rosemary, Sage, Lavender and the like.

Those, that shall well consider these Receipts, will finde therein not onely a fit proportion in the dose of all the particulars, but also great cautiousness in mixing nothing with them, that may destroy or change the natnre of our Volatil Salt; which is the thing, most to be avoided in the exhibition.

We might here adde many other Compositions, of which the Volatil Salt of Vipers may be the Ground; but we have contented ourselves to deliver these for examples, knowing, that there may be found divers others, good enough, in Books; and esteeming, that 'tis better to prepare them upon occasion according to exigency, and following the Receipts, which able Physitians may prescribe thereof.

We have also explain'd ourselves sufficiently in all particulars. We would have been more large, if we had not apprehended we might exceed our bounds, and undertake things, which might be thought to be beyond our reach, and to belong onely to knowing Physitians.

Those that know well to prepare this Vo-

Volatil Salt of Vipers, and to unite it well with the Volatil parts of Plants, and with the Sulphureous parts of certain Minerals, that are friendly to our nature, may ſay, that they have made ſome progreſs in their Profeſſion. We labour daily, and wiſh our ſelves able in time to impart ſomething to the publick, that may be more accompliſht:

FINIS.